MT9500 Recorder Maintenance and Service Manual

Astro-Med, Inc.®
Astro-Med Industrial Park
West Warwick, R.I. 02893

MT9500 Maintenance and Service Manual
Part Number -22834-091

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This document has been written as a Service and Maintenance manual for Astro-Med MT9500 recorders with SCN numbers in the 2X.X series. (The SCN number for your recorder is displayed early in the Power-Up/Self-Test sequence.) If you have a recorder with an SCN number of 1X.X or 3X.X, please contact the Customer Service Department at (401) 828-4000 before attempting any of the described procedures.

The manual has been divided into five sections:

Section One - **"General Information"**, contains a Trouble Shooting Procedure which lists possible causes and proposed solutions to a number of MT9500 fault conditions. Also included in this section is a guide to harnessing connections as well as instructions on how to complete a software update.

Section Two - **"MT9500 Calibration Procedures"**, outlines several checks and adjustments that may need to be done during the life of the recorder. Because of the high standards of Astro-Med design and production, routine adjustments of the recorder should not be necessary. These procedures are included for use only after a problem has been identified.

Section Three - **"MT9500 Part Removal Procedures"**, describes how to remove all of the field replaceable components within the MT9500.

Section Four - **"MT9500 Exploded Views and Parts Lists"**, provides a comprehensive listing of all of the remaining assemblies and components of the MT9500.

Section Five - **"MT9500 Schematic"**, provides the system schematic for the recorder.

As with all service and maintenance procedures, it is **highly** recommended that only a qualified Service Technician attempt **any** of the procedures outlined in this manual.

If you should have any questions or require assistance, please contact the **Customer Service Department** at Astro-Med at **(401) 828-4000**.

Trouble Shooting Procedure

Problem	Probable Cause	Solution
No Power to Recorder (Keypad not lit)	No AC Power Fuse Blown Faulty Keyboard Display or I/O boards	Connect AC power cord Check fuses and change if necessary (See P. 33) Replace Board(s) (See P. 41, 35)
Error Code appears following self test:		
Error Code 01	Keypad cannot communicate with main CPU	Replace I/O board or CPU board (See P. 35) Check Cable and Connectors
Error Code 02	Read/Write error while testing main memory	Replace CPU board (See P. 35)
Error Code 03	CPU Error	Replace CPU Board (See P. 35)
Error Code 04	I/O Board Error	Replace I/O Board (See P. 35)
Error Code 05	Interlock Error No paper Door Open INTLK Sensor problem	 Add paper (See Operators Manual) Firmly close door See Calibration section P. 21
Error Code 06	Master Controller Error Damaged Connectors Faulty Board	 Check integrity of harnesses and cables Replace Board (See P. 43)
Error Code 07	Slave Controller Error Damaged Connectors Faulty Board	 Check integrity of harnesses and cables Replace Slave Controller Board (See P. 43)
Error Code 08	A/D Board Error	Replace A/D Board (See P. 35)
Keypad doesn't respond after successful self-test	Incorrect Power-up Faulty Keypad Display Board	Turn unit on and off, repeat if necessary Replace Keypad Display Board (See P. 41)
Continuous paper feed	Paper loaded incorrectly Defective/Wrong Paper TOF sensor problem	Reload so that TOF mark is visible Change Paper (See Operators Manual) See Calibration procedure P. 21, 25 to recalibrate

Problem	Probable Cause	Solution
No printing on paper	Paper in upside down	Reload paper (See Operators Manual)
No printing on one side of paper	Faulty printhead connectors Faulty Master/Slave Controller Board	Check connector Replace Board for that side (See P. 43, 45)
Recorder stops printing and 'INTLK' appears	Out of paper INTLK sensor out of alignment	Refill paper See Calibration Section P. 25 to recalibrate
Poor Printing	Dirty Printheads Misadjusted printheads Wrong Paper	Clean printheads, see P. 27 Realign printheads, see P. 19 Change to recommended paper
Paper Skew	Printhead need adjustment Springs and thumbwheels on printhead bracket not properly adjusted	Adjust printheads, see P. 19 Adjust Springs and Thumbwheels, See P. 19
Dots missing from Chart	Faulty Printhead	Contact Customer Service Department
No signal response	Card Cage not powered Signal conditioner outputs not properly attached to recorder	Check card cage power cord Check connections and connectors
Poor Signal response	Filter on Signal conditioner improperly set Incorrect AC or DC Coupling selected on Signal Conditioner	Check setting on signal conditioner Remove Signal Conditioner, check and reset coupling if necessary
Incorrect Signal Amplitude	CAL Knob misadjusted	Place knob in 'CAL' position
Pegged Signals	Improper range selection on signal conditioner Input signal over input rating for recorder	Check range setting on conditioner
Cannot position trace	Switch 5 on A/D board positioned incorrectly	S5 on A/D board should be set to the right (facing recorder) (See P. 31)
Time/Date is cleared after power down	Switch 1 on I/O board (next to battery) in wrong position	S1 on I/O board should be set toward back of recorder (See P. 31)

Micro Step Motor Controller Board - 41626001

Harness #(on PCB)	Destination
P1	Master Controller Board - P3
P2	6V Stepper Motor, Motion Sensor
P3	TOF, INTLK
P4	5.12.24V Power Supply
Pin 1	+12V
Pin 2	+12V Common
Pin 3	+5V
Pin 4	+5V Common
Pin 5	+24VCommon
Pin 6	+24V
P6	6V Stepper Motor

Master Controller PC Board - 41630001

Harness #(on PCB)	Destination
P1	I/O Board - J6
P2	Left Printhead Channels 1 - 4
P3	Micro Step Motor Controller - P1
P5	24V Power Supply
P6	5.12.24V Power Supply
Pin 1	+5V Common
Pin 2	+5V
P7	Slave Controller PC Board - P7
P8	Slave Controller PC Board - P8
Pin 3	Pin 1
Pin 5	Pin 2
Pin 6	Pin 4

Slave Controller PC Board - 41630002

Harness #(on PCB)	Destination
P1	I/O Board - J7
P2	Right Printhead Channels 5 - 8
P3	No Connection
P5	24V Power Supply
P6	5.12.24V Power Supply
Pin 1	+5V Common
Pin 2	+5V
P7 Pin 2	IRIG Processor Board - P2, Pin 2
Pin 3	Master Controler Board - P7, Pin 3
P8	Master Controller Board - P8

I/O Board - 41211002

Harness # (on PCB)	Destination
P1	IRIG Processor Board - P1
Pin 3	Pin 3
Pin 4	Pin 1
J1	Keyboard Display PC Board - P1
J2	Card Cage/Signal Conditioner Input
J3	IRIG BNC
J4	Mother Board - J2
J5	15 SOC D-Shell
J6	Master Controller Board - P1
J7	Slave Controller PC Board - P1
J8	Keyboard Display PC Board - P3

Mother Board - 31309001

Harness #(on PCB)	Destination
J1	A/D Board - J6
J2	I/O Board - J4
J3	CPU Board - J1
J4	5.12.24V Power Supply
Pin 1, TP2	+5V Common
Pin 2, TP1	+5V
J5	5.12.24V Power Supply
Pin 1, TP5	- 12V
Pin 2, TP4	12V Common
Pin 3, TP3	+12V

A/D Board - 41210002

Harness #(on PCB)	Destination
P1	Left Potentiometer Board (Longer)
P2	Analog Input, 25 Pin D-Shell
P3	Right Potentiometer Board (Shorter)
P4	BNC Board
P5	Keyboard Display PC Board - P2
P7	To LA-95 Waveform LED Display (opt.)
J6	Mother Board - J1

Keyboard Display PC Board - 41220001

Harness #(on PCB)	Destination
P1	I/O Board - J1
P2	A/D Board - P5
P3	I/O Board - J8

CPU Board - 41209002

Harness #(on PCB)	Destination
J1	Mother Board - J3
J2	IEEE Parallel Input
J3	Serial Input

IRIG Processor Board (Optional) - 41627001

Harness #(on PCB)	Destination
P1	I/O Board - P1
P2	Slave Controller Board - P7, Pin 2
P3	5.12.24V Power Supply
Pin 1	+5V Common
Pin 2	+5V
Pin 4	+12V
Pin 5	12V Common
Pin 6	- 12V

The MT9500* software package consists of nine EPROMS. The locations of these are described below.

EPROM Part #	Location	Board #	Component #	Instructions for accessing PC Board on:
71004-640	I/O Board	41211002	U3	Page 35
71004-641	CPU Board	41209002	U10	Page 35
71004-642	CPU Board	41209002	U11	Page 35
71004-643	Master Controller Bd.	41630001	U11	Page 43
71004-644	Master Controller Bd.	41630001	U10	Page 43
71004-645	Slave Controller Bd.	41630002	U10	Page 45
71004-646	Slave Controller Bd.	41630002	U11	Page 45
71004-647	Microstepper Motor Controller	41626001	U8	Page 39
71004-648	Microstepper Motor Controller	41626001	U3	Page 39

For more information regarding MT9500 Software Updates, please contact the Customer Service Department at Astro-Med, Inc. (401) 828-4000.

* For MT9500 Recorders with SCN 2X.X only.

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Power Supply Voltage Level Check P. 15

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Print Quality Adjustment (Mechanical) P. 19

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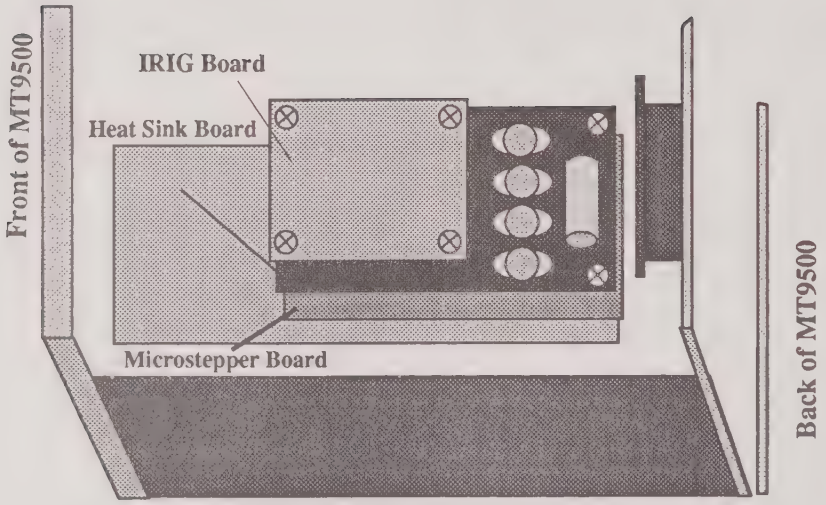
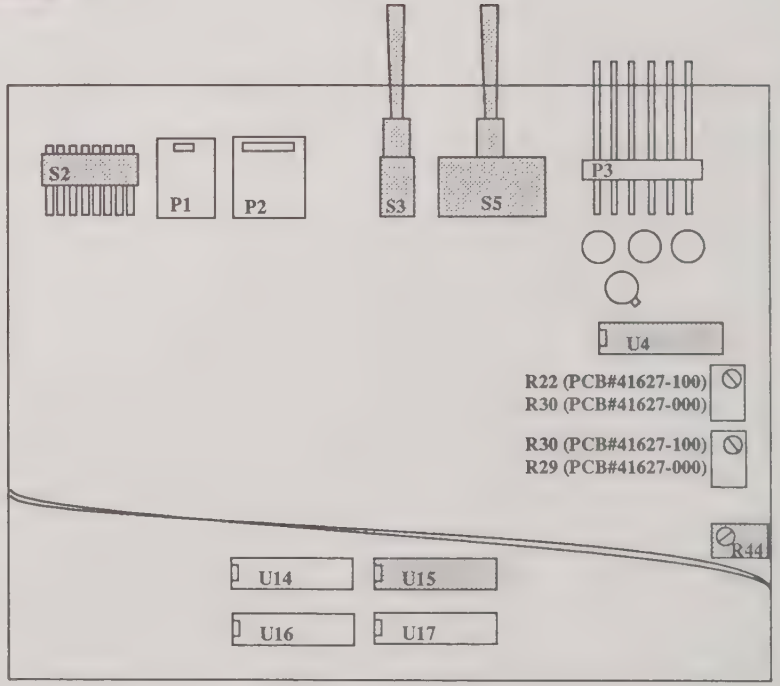
Interlock Detector P. 21
TOF Detector P. 21
Motor Sensor Adjustment P. 23

TOF and INTLK Sensor Adjustment (Mechanical) P. 25

Printhead Cleaning Procedure P. 27



Interior View of MT9500
(Right Side)



IRIG PCB (41627-X00)
Location of Important
Components

Equipment Required

1. Oscilloscope
2. Function Generator (IRIG Generator preferably)

IRIG PCB Switch Set-up

DIP Switch (S2)

	DSW1 *	DSW2	DSW3	DSW4	DSW5-8
All IRIG Codes	On (Up)	Off (Down)	Off	Off	Don't Care (Off)
NASA 36	On	On	Off	Off	Don't Care (Off)

*DSW = Dip Switch

Input Type Select Switch (S3) - Place in DOWN position for Modulated input, UP for TTL.

Frequency Select Switch (S5) - Set for appropriate frequency.

Switch Position	Frequency
UP	10KHz
CENTER	1KHz
DOWN	100Hz

(If input is TTL, switch position doesn't matter)

Calibration Procedure

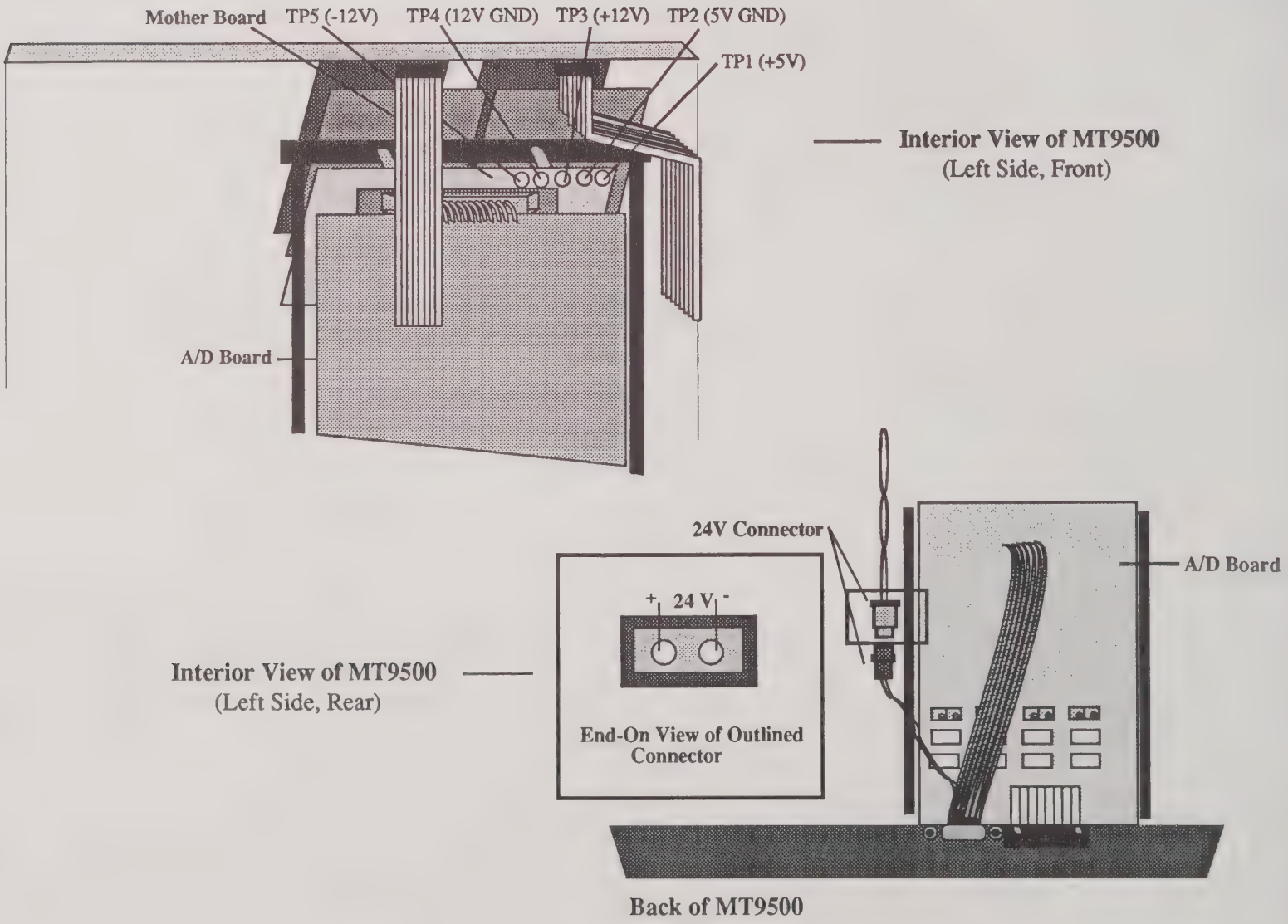
CAUTION: THE ABSOLUTE MAXIMUM **TTL INPUT** ALLOWED IS **5.3VDC**

1. Apply appropriate signal (between 500mV and 10V P•P). **MODULATED INPUT ONLY**

2. Adjust **R29** (PCB#41627-000) / **R30** (PCB#41627-100) for an output on **PIN 13 of U4** of 0.2V P•P (± 0.01V).

3. Adjust **R30** (PCB#41627-000) / **R22** (PCB#41627-100) for an output on **PIN 6 of U4** of 1V P•P (± 0.05V).

4. Adjust **R44** (for both PCB's) for an output on **PIN 8 of U15** of a proper TTL Level (**Note:** If the source is an IRIG Code Generator with TTL output, Place the TTL output on the unused channel of the oscilloscope and compare the pulse trains. Adjust R44 until any spurious noise or carrier dropout has been eliminated.)


Mother Board
TP5 (-12V)
TP4 (12V GND)
TP3 (+12V)
TP2 (5V GND)
TP1 (+5V)
A/D Board
Interior View of MT9500
(Left Side, Front)
24V Connector
A/D Board
+ 24 V -
Interior View of MT9500
(Left Side, Rear)
End-On View of Outlined
Connector
Back of MT9500

1. 5 Volt and 12V Power Supply Check

Verify the following voltages at the designated test points on the **MOTHER BOARD.**

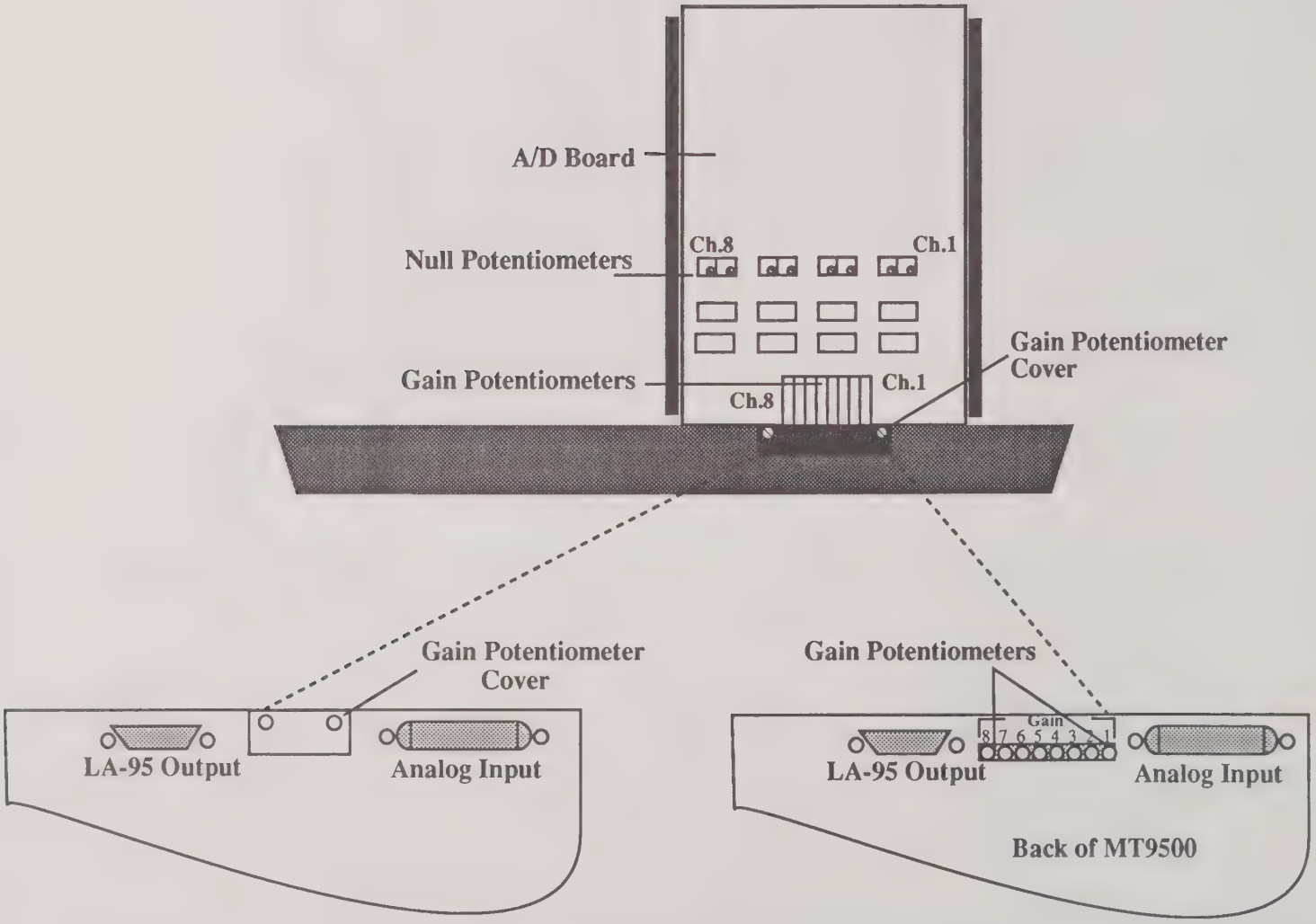
Between **TP1** (+) and **TP2** (GND)	+5V± 0.1VDC (+5V Supply)
Between **TP3** (+) and **TP4** (GND)	+12V±0.5VDC (+12V Supply)
Between **TP5** (-) and **TP4** (GND)	- 12V±0.5VDC (-12V Supply)

2. 24V Power Supply Check

Verify the level of the 24V Power Supply by monitoring the voltage at the **24V Connector.** This connector can be identified by the Gray and Black wires that run from the LA-95 D-Shell Connector to the 24V Connector.

To Check the Voltage Level, gently separate the two sections of the connector and monitor for a voltage of **24V ±0.5V** at the connector as illustrated (see figure to the left).

3. If any of the tested voltages are not within tolerance, the corresponding power supply requires calibration. This calibration should not be attempted in the field. Please contact the Customer Service Department at Astro-Med (401) 828 - 4000 for assistance.



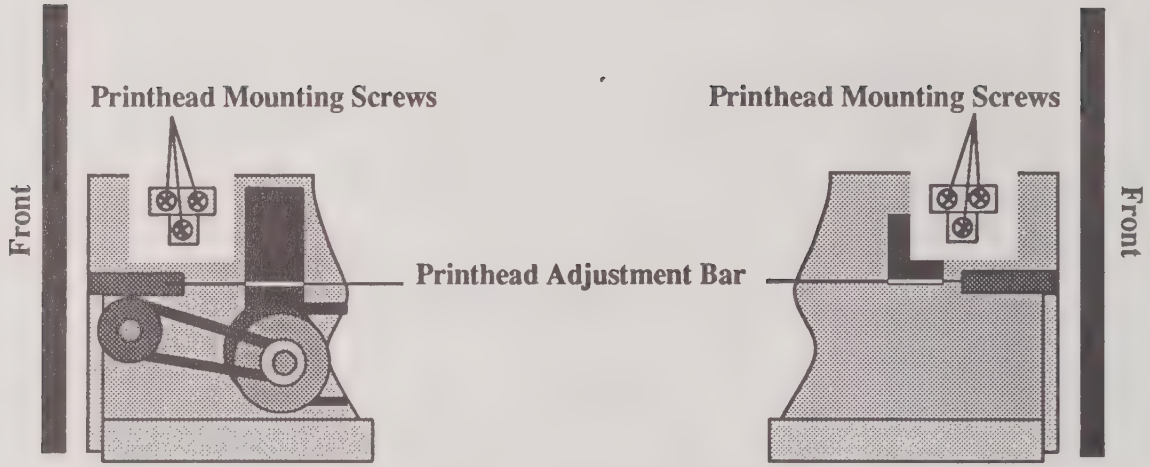
Interior View and Rear Panel Detail of MT9500

Zero Offset Adjustment Procedure

1. Turn all **CAL Knobs** (front panel of the MT9500) to the **GND** position.
2. Short the signal inputs (analog input or 8 input BNC connectors) to ground.
3. Position the traces to the center of each channel.
4. Switch the **CAL Knobs** back to the **CAL** position.
5. Set traces for center of channels by adjusting the **NULL Potentiometers** on the **A/D Board.**
6. Alternately switch the **CAL Knobs** between **CAL** and **GND.** The traces should remain in the center of the channels.

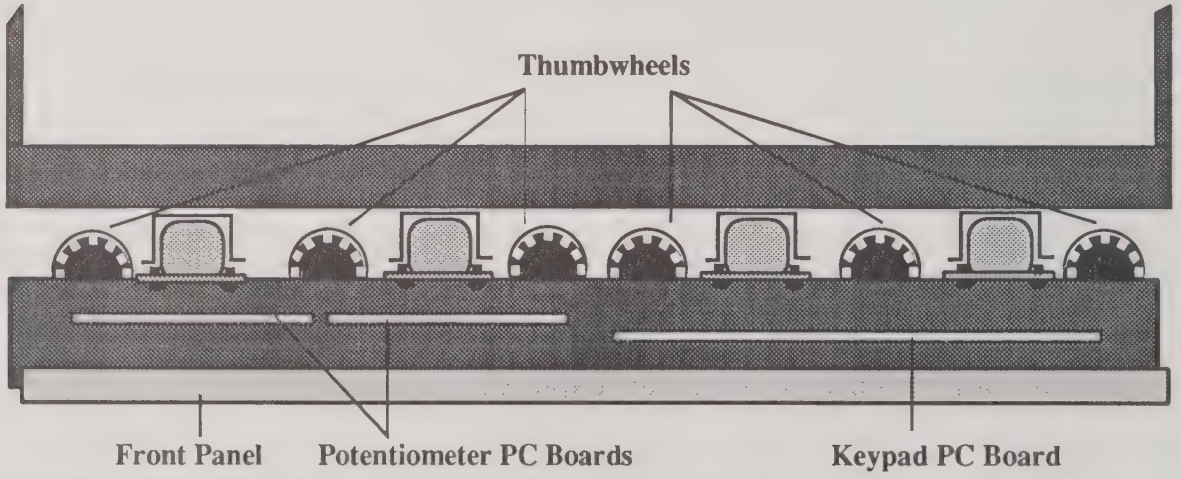
Sensitivity Adjustment Procedure

1. Select the **8 Channel, Real Time Mode** by pressing **[MODE] [ENTER]** on the Front Panel Keypad Controls.
2. Position each trace in alignment with the right baseline.
3. Input **500mV** (or input voltage specified on the P.O.) to each channel through either the analog input D-Shell or the eight input BNC connectors.
4. Remove the **Gain Potentiometer Cover** which is located on the back panel of the MT9500 between the LA-95 output and the Analog Input D-Shell.
5. Adjust the **GAIN Potentiometers** for full scale deflection to the left baseline.



Right Side View of MT9500

Left Side View of MT9500



Top Down View of Interior of MT9500 (front)

Printhead Alignment Bar Adjustment

1. Loosen the **Printhead Mounting Screws.**

2. These Screws can be located on both sides of the MT9500 on the upper, front edge of the side panel and can be distinguised from the other screws on the side panel by the silver metal T-Plate that they are mounted on.

3. Readjust the Printhead by gently moving the **Printhead Alignment Bar** forward and backwards until optimum print quality is obtained.

Adjustment of Print Density

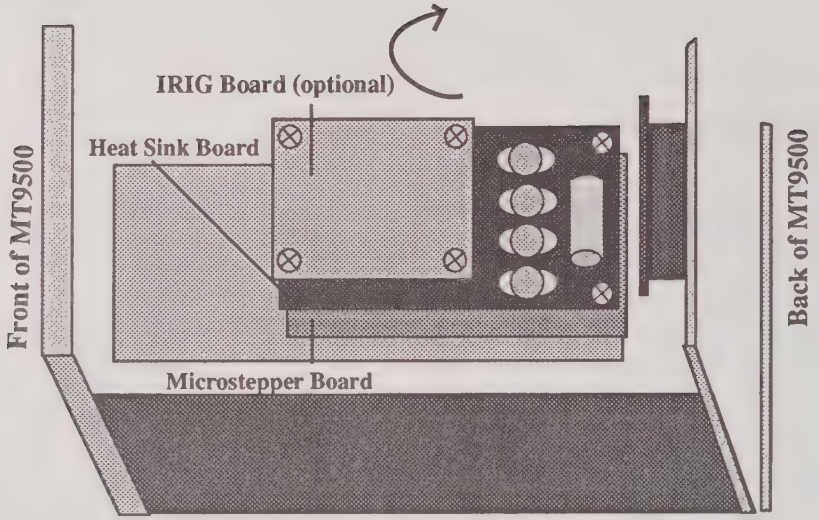
1. The **Thumbwheels**, located just behind the front panel and below the **Potentiometer** and **Keypad PC Boards**, can be utilized to achieve uniform print density across the chart.

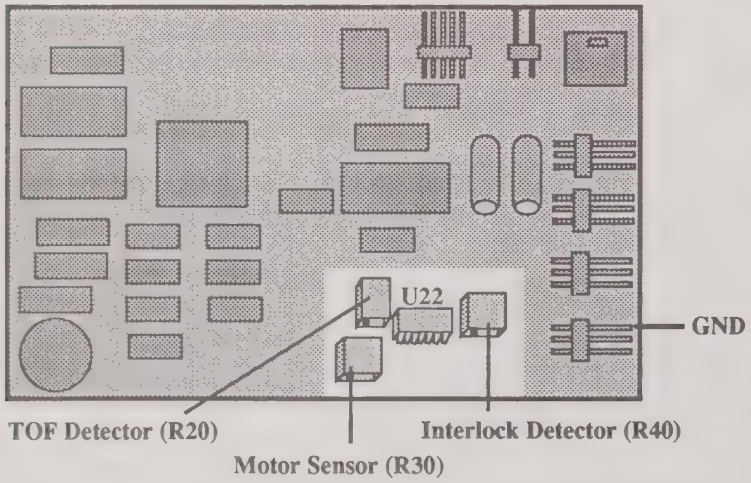
2. There are six **Thumbwheels** that control the pressure on the printhead and therefore the density of the printout. There are three thumbwheels for each half of the chart.

3. Tighten the **Thumbwheels** for better uniform density across the chart if necessary. Do not overtighten. Make sure that pressure is even across both printheads as uneven pressure may cause the paper to skew.

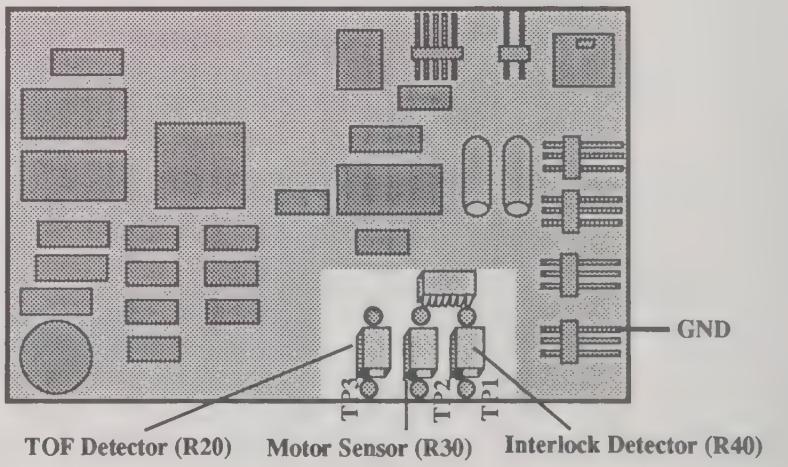
4. Check that the rectilinearity (the squareness of the grid with respect to the edge of the paper) across the chart is within 1mm.

No Electrical Recalibration of Print Quality is Necessary





MicroStepper Board 41626-000 REV B



MicroStepper Board 41626-000 REV C

Please refer to the illustration and instructions that corresponds to the Rev of the Microstepper Board (41626-000) that is currently installed in your MT9500 recorder.

41626-000 REV B

41626-000 REV C

General Set-up and Preparation

1. Remove the **P1**, **P2**, and **P3** harnesses as well as the screws that secure the **IRIG PC Board** (#41627-001)to the **Heat Sink Board**.
2. Gently lift the **IRIG Board** off.
3. Remove screws that secure the **Heat Sink Board** to the **Microstepper board** (#41626000) leaving the **P5**, **P7**, **P8**, **P9**, and **P10** harnesses connected.
4. Lift the **Heat Sink Board** to expose the **Microstepper Motor Controller Board**.

Interlock Detector

1. Feed paper into the recorder according to the instruction outlined in your operators manual, observing that it is tightly wrapped around the drive roll.

2. Check the Voltage between **Pin 6 of U22 and GND**

2. Check the voltage between **TP1(INTLK) and GND.**

3. The voltage reading should be **225mV±75mV**. If a voltage in this range is not observed adjust trim potentiometer **R40** until a proper voltage level is obtained.

4. Remove the paper and again check the voltage as in **Step 2.** The voltage should now be greater than **2.5V**.

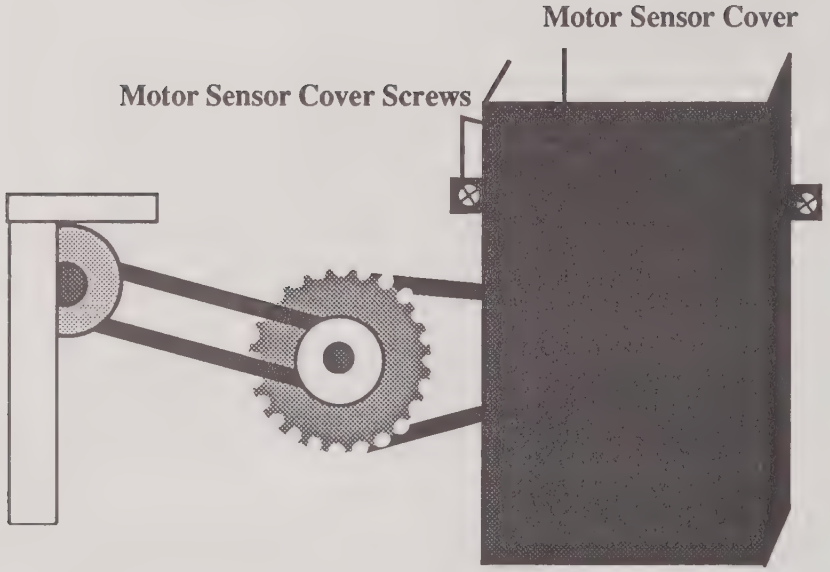
TOF Detector

1. Check the voltage between **Pin 10 of U22 and GND**

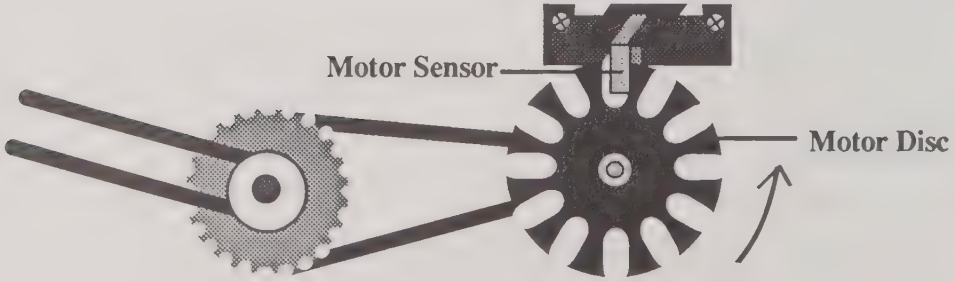
1. Check the voltage between **TP3 (TOF) and GND**

2. The voltage reading should be **225mV±75mV**. If a voltage in this range is not observed, adjust trim potentiometer **R20** until a proper voltage level is obtained.

3. Adjust the **TOF** mark by gently pulling on the paper so that the mark is directly in front of the sensor. When this occurs, the voltage read at the points outlined in **Step 1** should be greater than **2.5V**.



Right Side View of MT9500



Motor Sensor Adjustment

41626-000 REV B

41626-000 REV C

1. Remove the screws from the **Motor Sensor Cover** located on the right side of the MT9500, as illustrated to the left.

2. Set the motor disc so that the disc doesn't block the sensor.

3. Check the voltage between **Pin 4 and GND of U22.**

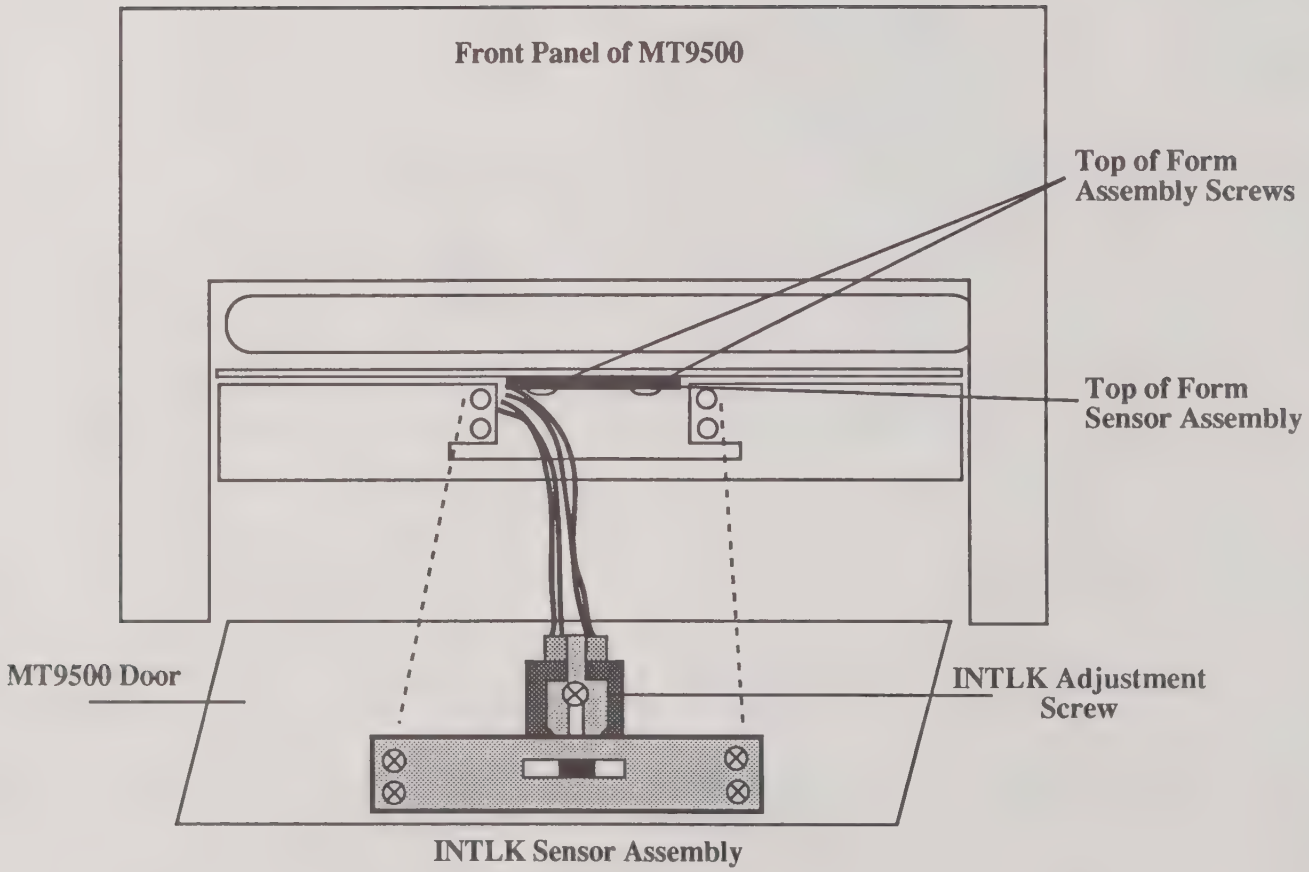
3. Check the voltage between **TP2 and GND.**

4. The voltage reading should be **225mV±75mV.** If a voltage in this range is not observed, adjust trim potentiometer **R30** until a proper voltage reading is obtained.

5. Rotate the **Motor Disc** until the sensor is blocked.

6. The reading between **Pin 4 and GND of U22** should be greater than **2.5V.**

6. The reading between **TP2 and GND** should now be greater than **2.5V.**


Front Panel of MT9500
Top of Form
Assembly Screws
Top of Form
Sensor Assembly
MT9500 Door
INTLK Adjustment
Screw
INTLK Sensor Assembly

Note: Disconnect the power to the MT9500 before beginning these procedures.

INTLK Sensor Mechanical Adjustment

1. Remove the four screws that attach the **INTLK Sensor Assembly** to the front frame of the MT9500.

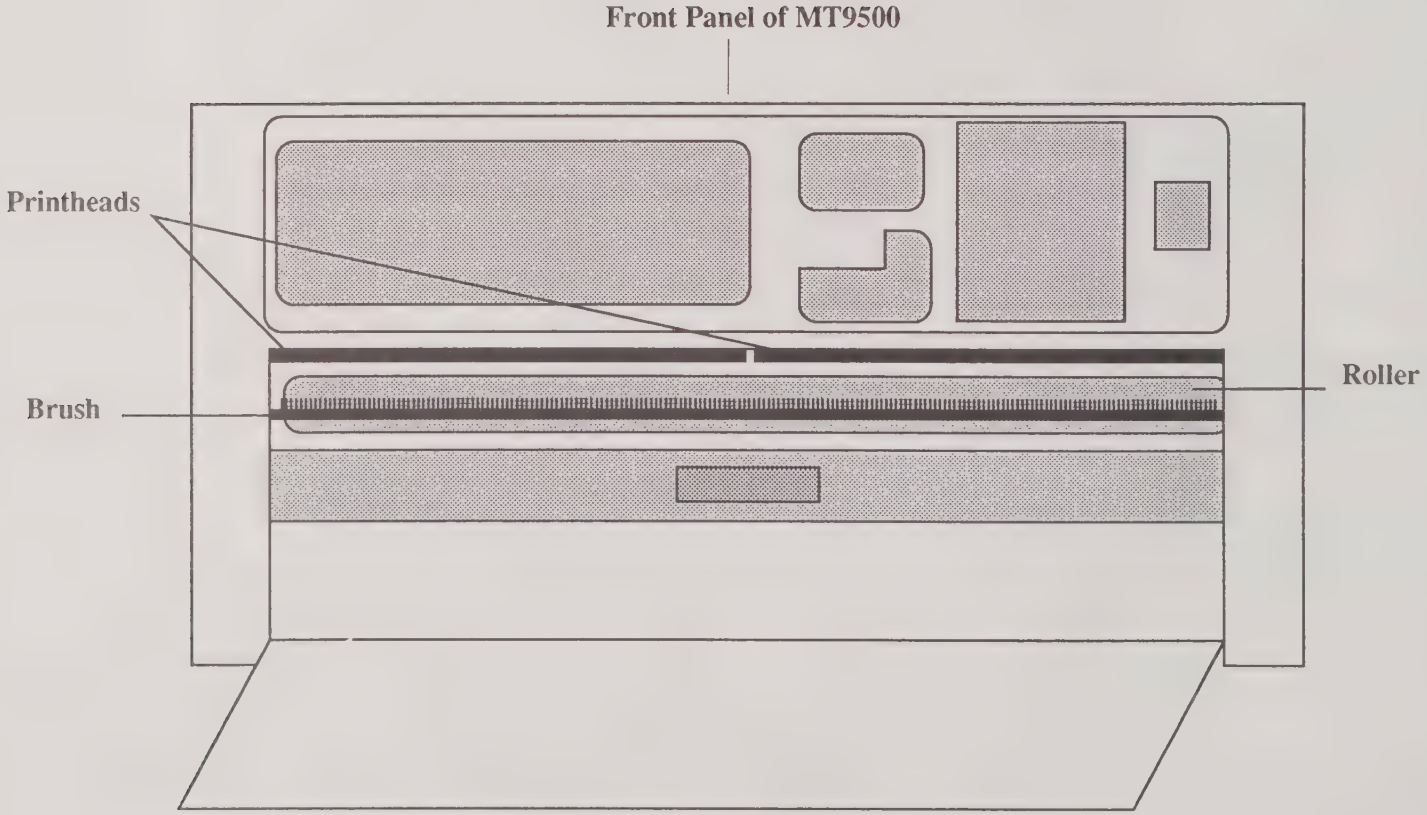
2. If it is necessary to readjust the alignment of the **INTLK Sensor**:
   - **A. Loosen** the **INTLK Adjustment Screw** located on the top of the Sensor Assembly.
   - **B.** Slide the sensor forward so that it is flush and square with the opening in the panel (the INTLK adjustment screw should be in the back of the slot).

Top of Form Sensor Mechanical Adjustment

1. Remove the two **Allen Screws** that attach the Top of Form Assembly Bracket to the front panel frame (see illustration left).

2. The Assembly can now be removed by sliding it backwards slightly to remove it from the lip that it is mounted on.

3. If it is necessary to readjust the alignment of the **Top of Form Sensor**:
   - A. **Loosen** the **Top of Form Adjustment Screw** located on the top of the Sensor Assembly.
   - B. Slide the sensor forward so that the back of the sensor is flush and square with the back of the bracket.


Front Panel of MT9500
Printheads
Brush
Roller

The **Printheads** on the MT9500 recorder may, after an extended period of use accumulate a residue, particularly if an inferior quality of thermal paper is used.

To Clean the Printheads:

1. Turn the **power off** and **unplug the recorder**.

2. Locate the **printheads.** They can be found just above the **roller bar.**

3. Dampen a **lint-free** cloth with **isopropol alcohol**, then fold the cloth so that it can be inserted between the roller bar and the printheads and gently wipe back and forth along the length of the printheads.

4. The **printing elements** are located within a half inch of the front of the printhead assembly, there is no need to insert the cloth past this point.

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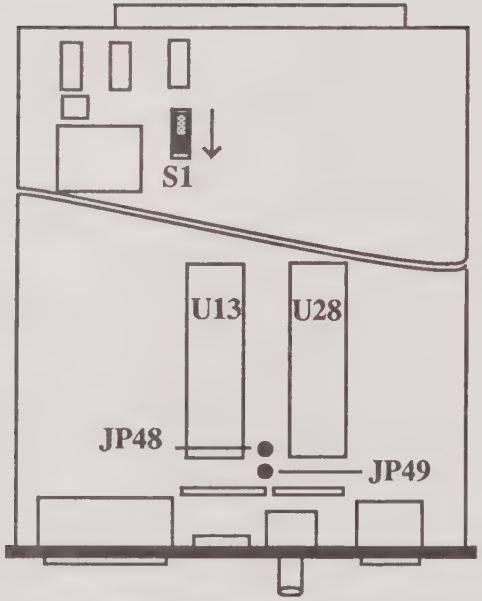
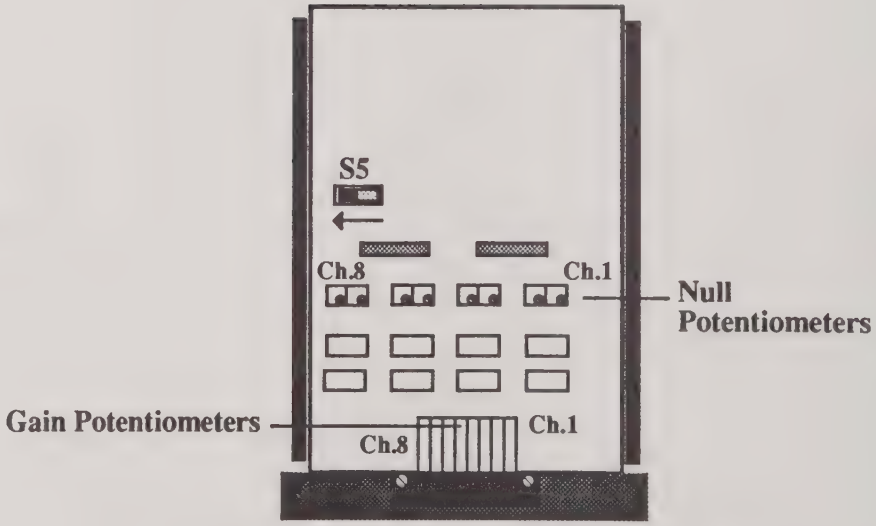
Fuse Changing Procedure	P. 33
Replacement of A/D, I/O and CPU Board Assemblies	P. 35
Replacement of Mother Board	P. 37
Replacement of IRIG/Microstepper Board	P. 39
Replacement of Keypad PC Board Assembly	P. 41
Replacement of Master Controller PC Board	P. 43
Replacement of Slave Controller PC Board	P. 45
Replacement of Potentiometer PC Boards	P. 47
5.12.24V Power Supply Replacement	P. 49
Lightbulb Replacement	P. 51
Stepper Motor Replacement	P. 53
Roller Brush Replacement	P. 55



MT9500 I/O PC Board (41211-X)



MT9500 A/D PC Board (41210-X)

When replacing a PC board which contains EPROMS, the EPROM from the original board must be placed in the new PC Board to ensure that the software package for the recorder remains compatible.

MT9500 (SCN 1X.X)				MT9500 (SCN 2X.X)			
Board	**Board#**	**EPROM #**	**Component#**	**Board**	**Board#**	**EPROM Part#**	**Component #**
I/O	41211-001	71004-600	U3	I/O	41211-002	71004-640	U3
CPU	41209-002	71004-601	U10	CPU	41209-002	71004-641	U10
CPU	41209-002	71004-602	U11	CPU	41209-002	71004-642	U11
Master Contrl	41205-005	71004-603	U10	Master Contrl.	41630-001	71004-643	U11
Master Contrl	41205-005	71004-604	U11	Master Contrl.	41630-001	71004-644	U10
Master Contrl	41205-005	71004-605	U12	Slave Contrl.	41630-002	71004-645	U11
Master Contrl	41205-005	71004-606	U13	Slave Contrl.	41630-002	71004-646	U10
Slave Contrl	41205-006	71004-605	U12	Microstepper	41626-001	71004-647	U8
Slave Contrl	41205-006	71004-606	U13	Microstepper	41626-001	71004-648	U3
Slave Contrl	41205-006	71004-607	U10	IRIG	41627-001	61081-050	U9
Slave Contrl	41205-006	71004-608	U11				

Additional Information Relating to Specific PC Boards

I/O PC Board (41211-X)

1a. No Modulated IRIG Board Installed:
-Install Jumper between JP48-49. (Page 3)

1b. Modulated IRIG Board Installed:
- Check that JP48-49 is open. (Page 3)
- If I/O board does not have JP48-49, contact the factory before exchanging boards.

2. Set SW1 toward back of unit. (Page 3)

A/D PC Board (41210-X)

1. Set SW5 to the right (facing recorder). (Page 3)
2. Gain/Null** potentiometers may need to be recalibrated. (See Page 5)
3. Install original LA-95** (AUX) harness on new board

IRIG PC Board (31436-001)

1. Check that JP48-49 is open on I/O Board. (Page 3)

I/O PC Board (41211-002)

1. Check that JP48-49 is open. (Page 3)
2. Set SW1 toward back of recorder. (Page 3)

A/D PC Board (41210-002)

1. Set SW5 to the right (facing recorder). (Page 3)
2. Gain/Null Potentiometers may need to be recalibrated. (See P. 5)
3. Install original LA-95** harness on new board.

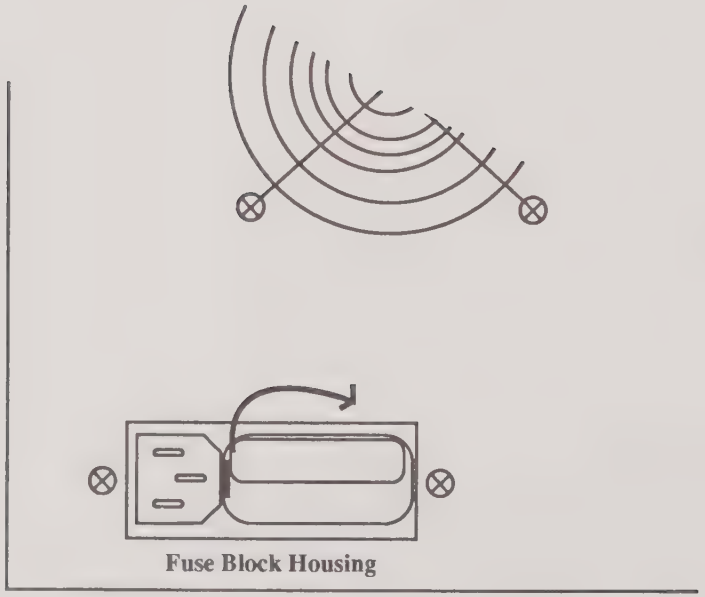
IRIG PC Board (41627-001) - See Page 4

1. Check that JP48-49 is open on I/O Board. (Page 3)

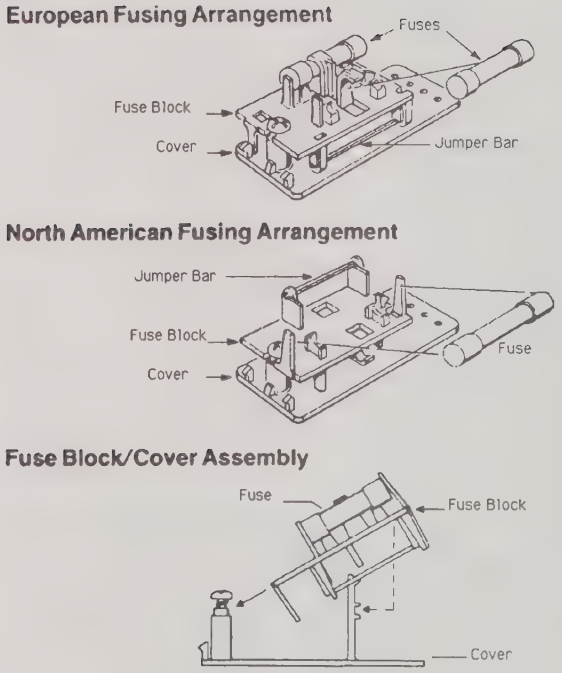
Microstepper PC Board (41626-001)

1. Recalibrate Sensors. (See Page 6-7, 9)

**May not be present in all recorders



Rear Panel of MT9500



Fuse Replacement Diagram

Fuse Block Arrangement

The fuses for the MT9500 are located in the fuse block housing which can be found in the lower left hand corner of the rear panel.

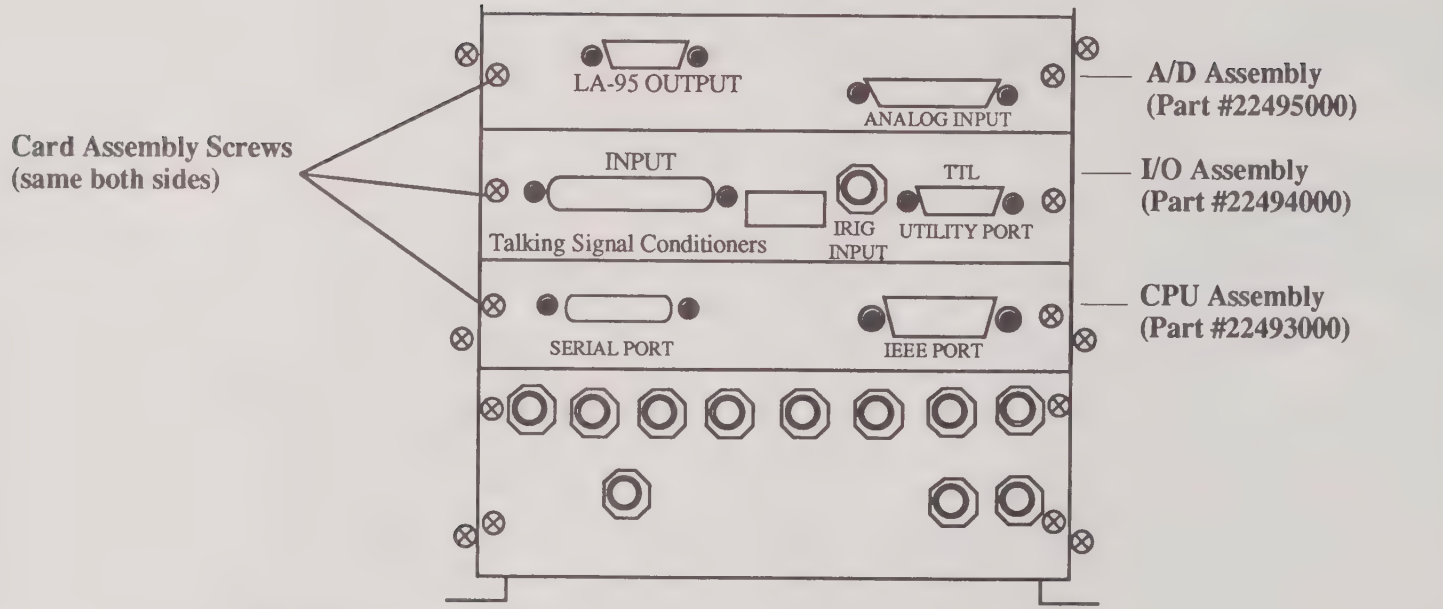
To change a fuse(s):

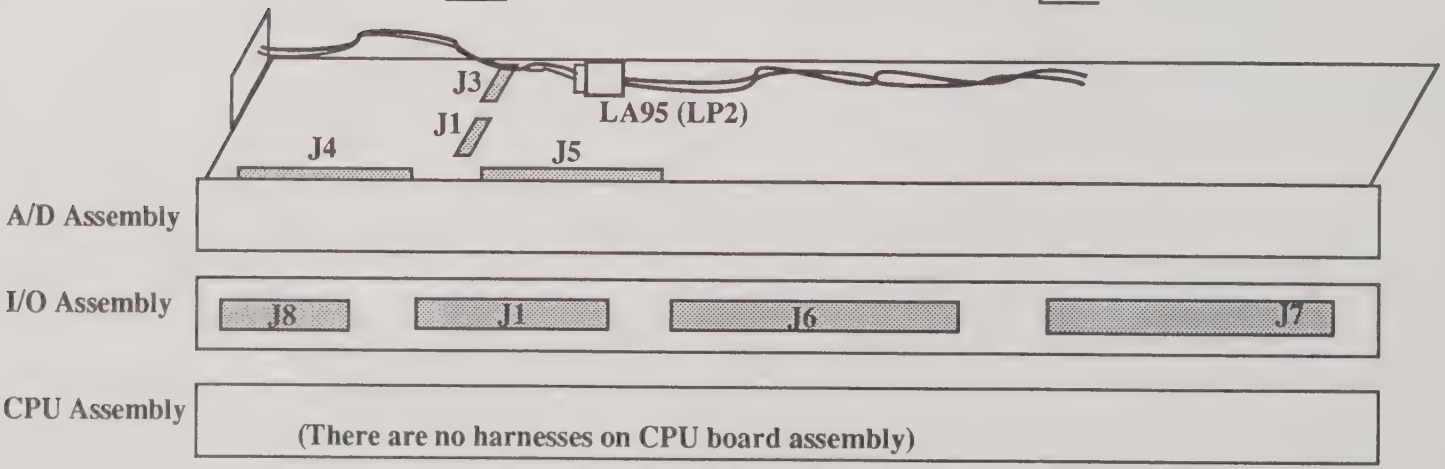
1. Turn the **power OFF** and disconnect the power cord.
2. Open the cover of the power entry module using a small blade screwdriver and remove the cover.
3. Loosen the Phillips-head mounting screw that attaches the fuse block to the cover of the module.
4. Slide the fuse block upward and pull it away to release it from the Phillips-head mounting screw and pedestal.
5. Change the fuse(s).

120V Operating Voltage requires a 6 Amp, 250V fuse
240V Operating Voltage requires a 3 Amp, 250V fuse

6. Slide the fuse block back onto the Phillips-head mounting screw and pedestal (fuses that go into the fuse housing first are the active fuses) and tighten the screw.

Back View of MT9500 (Card Cage)





Left Side View of MT9500 (Card Cage)

Introduction

If it should become necessary to replace either the A/D, I/O, or CPU boards, the boards should be ordered with the rear panel assembly attached. The order numbers for the Board Assemblies are:

A/D Board Assembly - #22495000
I/O Board Assembly - #22494000
CPU Board Assembly - #22493000

To Remove a Board Assembly :

1. Turn the **Power OFF** and **unplug the recorder.** Remove the Top Cover of the MT9500 by removing the six screws that attach the top cover to the side plates, gently bend the cover away from the side plates and lift off. The card cage with the A/D board on top is located on the left side of the chassis (facing front).

2. A/D Board Assembly removal (Please refer to the illustrations on the facing page.)

A. Remove harnesses **J1, J3, J4, J5 and LP2.**
B. Remove **Card Assembly Screws** FOR THAT CARD ONLY.
C. Slide card out and replace.
D. Replace harnesses** and screws.

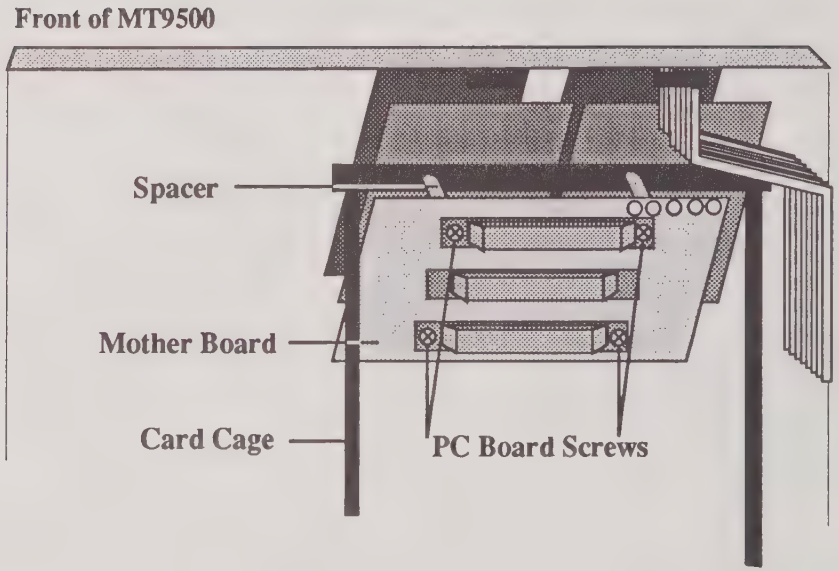
3. I/O Board Assembly removal

A. Remove harnesses **J8, J1, J6 and J7.**
B. Remove **Card Cage Assembly Screws** for that card.
C. Slide card out and replace.
D. Replace harnesses** and screws.

4. CPU Board Assembly removal

A. Remove **Card Cage Assembly Screws** for that card.
B. Slide card out and replace.
C. Replace screws.

** See Harnessing Information, Page 6



Interior View of MT9500 (Left Front)

To replace the Mother Board (31309-001):

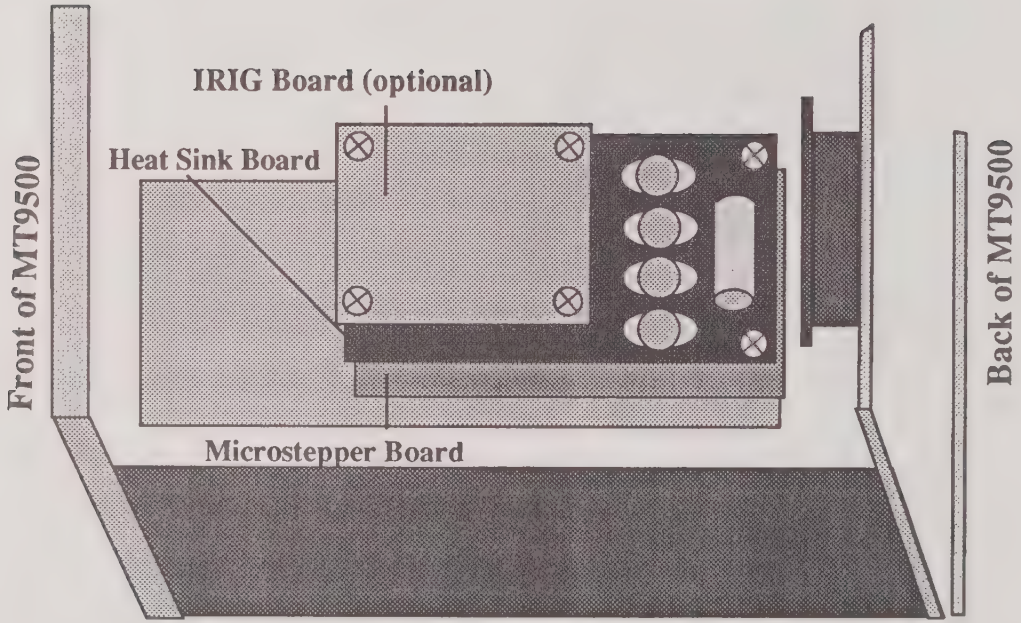
1. Turn the **Power Off** and **unplug the recorder.**

2. Remove the **A/D, I/O and CPU Board Assemblies from the Card Cage** (See Pages 34, 35 for complete instructions).

3. Remove harnesses **J4** and **J5** from the **Mother Board.**

4. Remove the four screws that attach the **Mother Board** to the rear plate of the **Card Cage.**
   Note: Hold on to the spacers while removing the screws to avoid dropping the spacers into the unit.

5. Replace the Mother Board and reassemble.



Interior View of MT9500
Left Side

To Remove the IRIG PC Board (41627001):

1. Turn the **Power Off** and **unplug the recorder.** Remove the top cover of the MT9500 by unfastening the six screws that attach it to the side plates.

2. Remove the **P1, P2,** and **P3** harnesses as well as the screws that secure the **IRIG PC Board** (#41627-001) to the **Heat Sink Board.**

3. Exchange the IRIG PC Board and reassemble the unit.

To Remove the Microstepper PC Board (41626000):

1. Remove the IRIG PC Board.

2. Remove screws that secure the **Heat Sink Board** to the **Microstepper board** (#41626000).

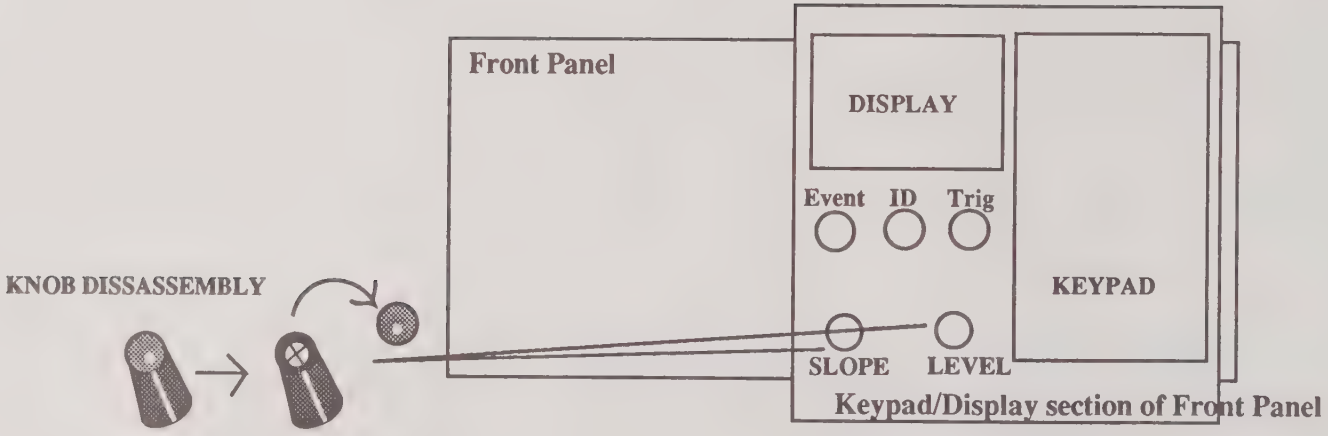
3. Remove harnesses **P5, P7, P8, P9,** and **P10** from the Microstepper board.

4. Lift the **Heat Sink Board** off to expose the **Microstepper Motor Controller Board.**

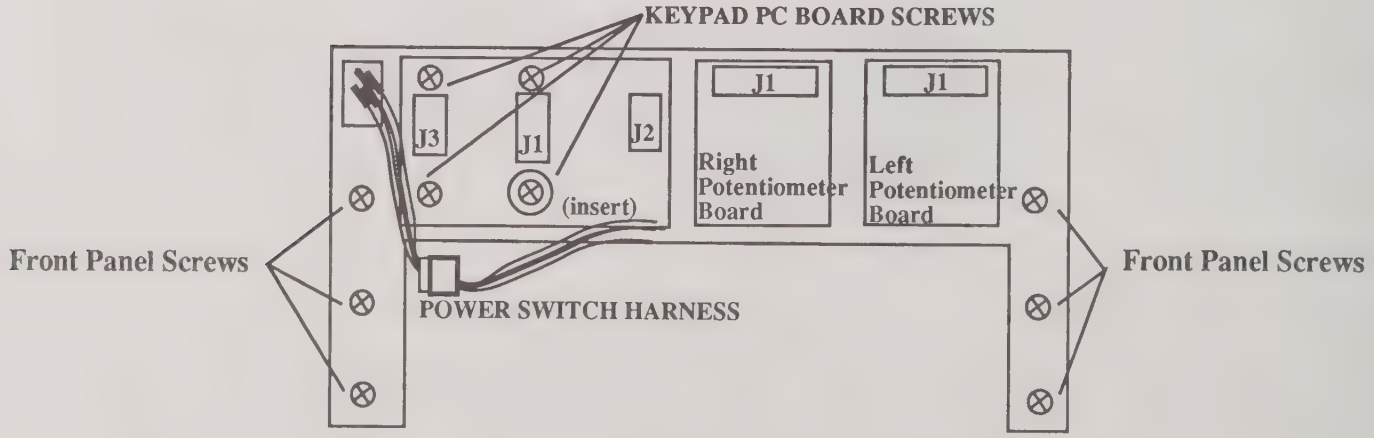
5. Remove harnesses **P1, P2, P3, P4, and P6** from the **Microstepper board.**

6. Remove the four screws (PEMS) that attach the **Microstepper board** to the base plate.

7. Exchange the **Microstepper board** and reassemble.



MT9500 Front Panel



Inside View of Front Panel

Note: The replacement of this board is somewhat complicated. Attempt to eliminate all other possible causes of the problem before replacing this board.

To Swap the Keypad PC Board:

1. Turn the **Power Off** and **unplug the recorder**. Remove the **Knob Assemblies** from the **Slope and Level** controls located on the display panel.
   - **A.** First remove the top of the cap as illustrated to the left.
   - **B.** Loosen the exposed screw sufficiently to remove the entire knob assembly.

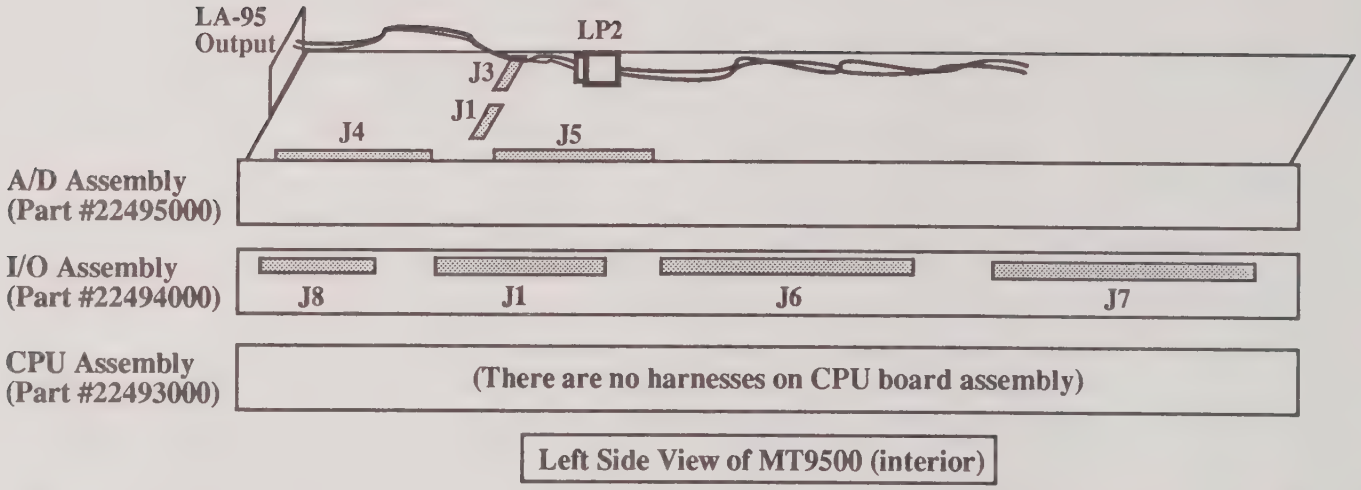
2. Remove the three harnesses **J1, J2, and J3** from the **Keypad PC Board.**

3. Remove the **J1** harnesses from the **Right and Left Potentiometer Boards.**

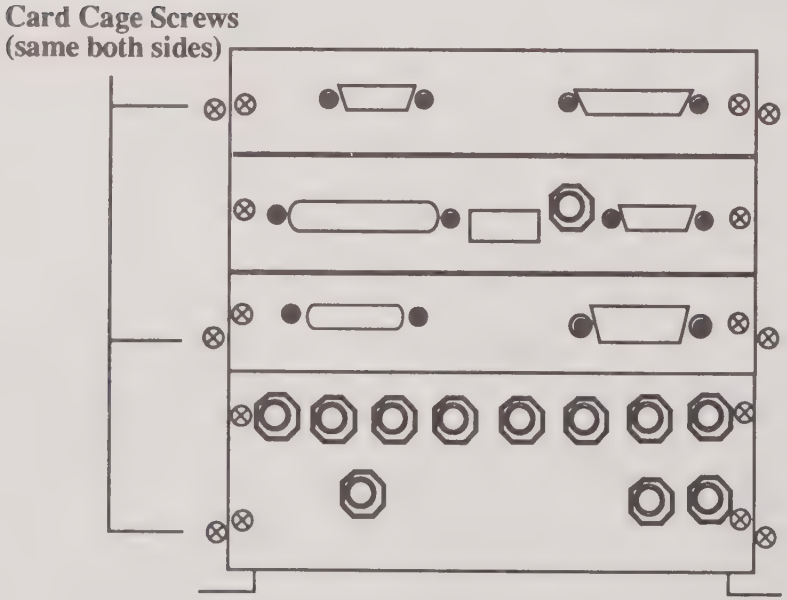
4. Remove the **Front Panel** of the recorder by:
   - **A.** Removing the six screws that connect the side plates to the front panel.
   - **B.** Cut the cable tie that secures the power switch harness to the top of the printhead assembly.
   - **C.** Disconnect the **Power Switch Harness**.

5. Remove the four screws that secure the **Keypad PC Board** to the back of the **Front Panel**.

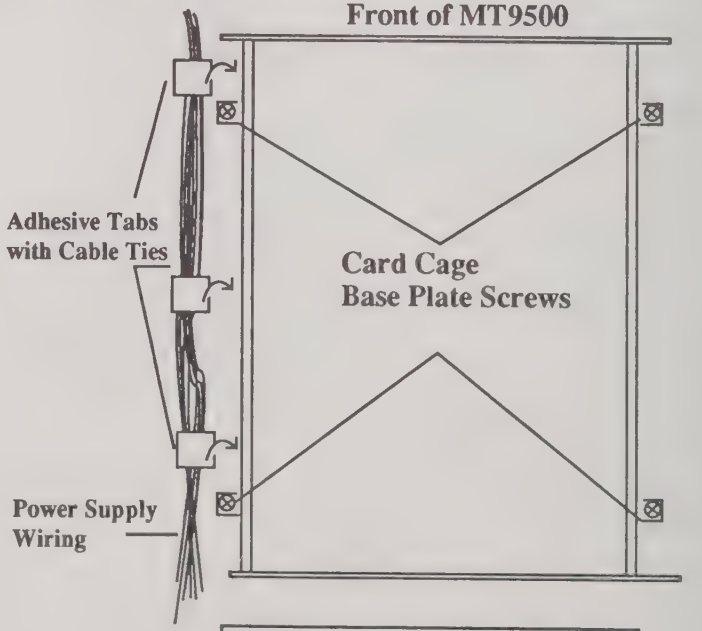
6. Replace the **Keypad PC Board** (Part # 41220-001).



Left Side View of MT9500 (interior)



Back View of MT9500 (Right Side)



Interior of MT9500 (Left Side)

In order to access and replace the Master Controller PC Board the Card Cage containing the A/D, I/O and CPU boards must be removed.

To remove the MT9500 Card Cage:

1. Turn the **Power Off** and **unplug the recorder**. Disconnect the following harnessing:
   A. A/D Board - **J1, J3, J4, J5, LP2**
   B. I/O Board - **J1, J6, J7, J8**
   C. Mother Board - **J4, J5**

2. Remove the six **Card Assembly Screws** that secure the Card Cage to the Rear Panel.

3. Either cut the cable ties or remove the adhesive tabs that secure the **Power Supply Wiring** to the Card Cage.
   A. Remove the four screws that attach the card cage to the support plate.
   B. Remove the **Card Cage** by carefully lifting it straight up to avoid damaging the **Potentiometer Boards** which are attached to the interior front panel.

This will expose the **Master Controller PC Board** (# 41630000).

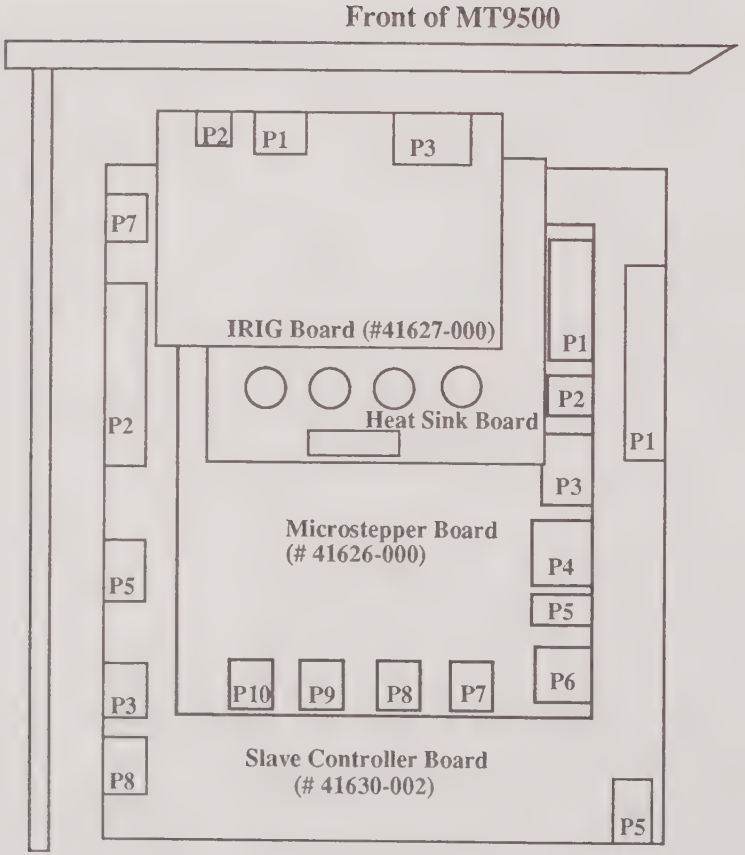
To remove the Master Controller Board:

1. Remove the four screws that attach the board to the support plate.

2. Remove the following harnesses from the board:
   A. **J1, J2, J3, J5, J6 and J8**
   B. If the MT9500 unit is equipped with an **IRIG board**, also disconnect **J7.**

3. Exchange the **Master Controller Board.**
   A. Replace the harnesses.**
   B. Replace the screws.
   C. Replace the Card Cage.

** See Harnessing Information, Page 6.



Board	Harness # (on PCB)	Color
IRIG	J3	blk,red,org,blk,blu
(41627-000)	J2	red
	J1	yel,org
Microstepper	P1	14wire ribbon conn.
(416260-000)	P2	brn,blk, wh/org,blk
	P3	brn,blk,wh/grn,brn,blk,blk,wh/blu
	P4	org,blk,red,blk,blk,gry
	P5	gry,gry (resistor harness,heat sink board)
	P6	red,yel,org, brn,blk,wht
	P7-10	red,blk,org (transistors, heat sink board)
Slave	P1	40 wire ribbon connector
Controller	P2	40 wire ribbon connector
(41630-002)	P3	no connection
	P5	blk,gry
	P6	blk,red
	P7	org,red
	P8	blu,grn,org

To replace the **Slave controller PC Board** the **IRIG board** (41627-000), **Heat Sink board**,and **Microstepper board** (41626-000) must be removed first (see illustration to left). Since the entire replacement process requires the disconnection of 19 harnesses, special attention to the location of each harness is urged during disassembly.

To replace the **Slave Controller Board** (41630-002):

1. Turn the **Power Off** and **unplug the recorder.**

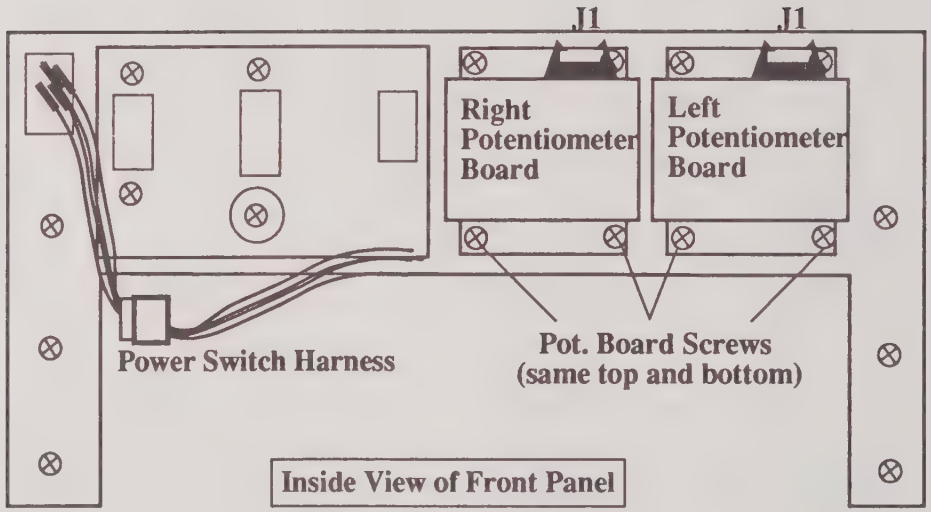
2. Remove the **IRIG Board** (41627-000), if installed, by removing the screws and harnesses **J1, J2, and J3.**

3. Remove the **Heat Sink Board** by removing the screws and posts from the PCB and the connecting harnesses **P5, P7, P8, P9, and P10** from the **Microstepper board** (41626-000).

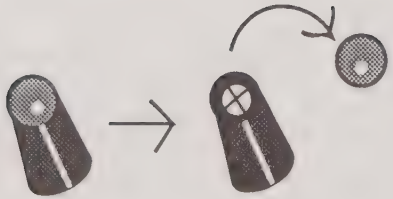
4. Remove the **Microstepper Board** (41626-000) by removing the posts and harnesses **P1, P2, P3, P4, and P6.**

5. Remove the **Slave Controller Board** (41630-002) by removing harnesses **P1, P2, P5, P6, P7, and P8**.

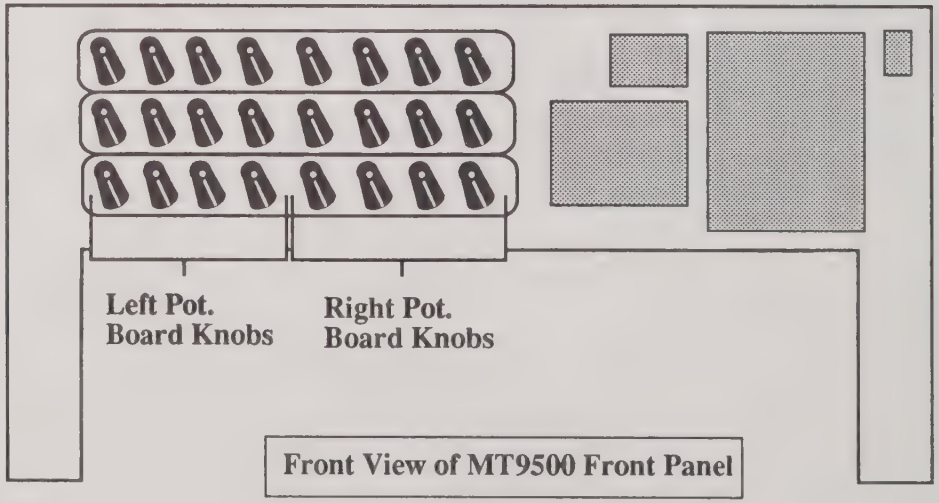
6. Replace the **Slave Controller Board** and reassemble.



Inside View of Front Panel



Knob Disassembly



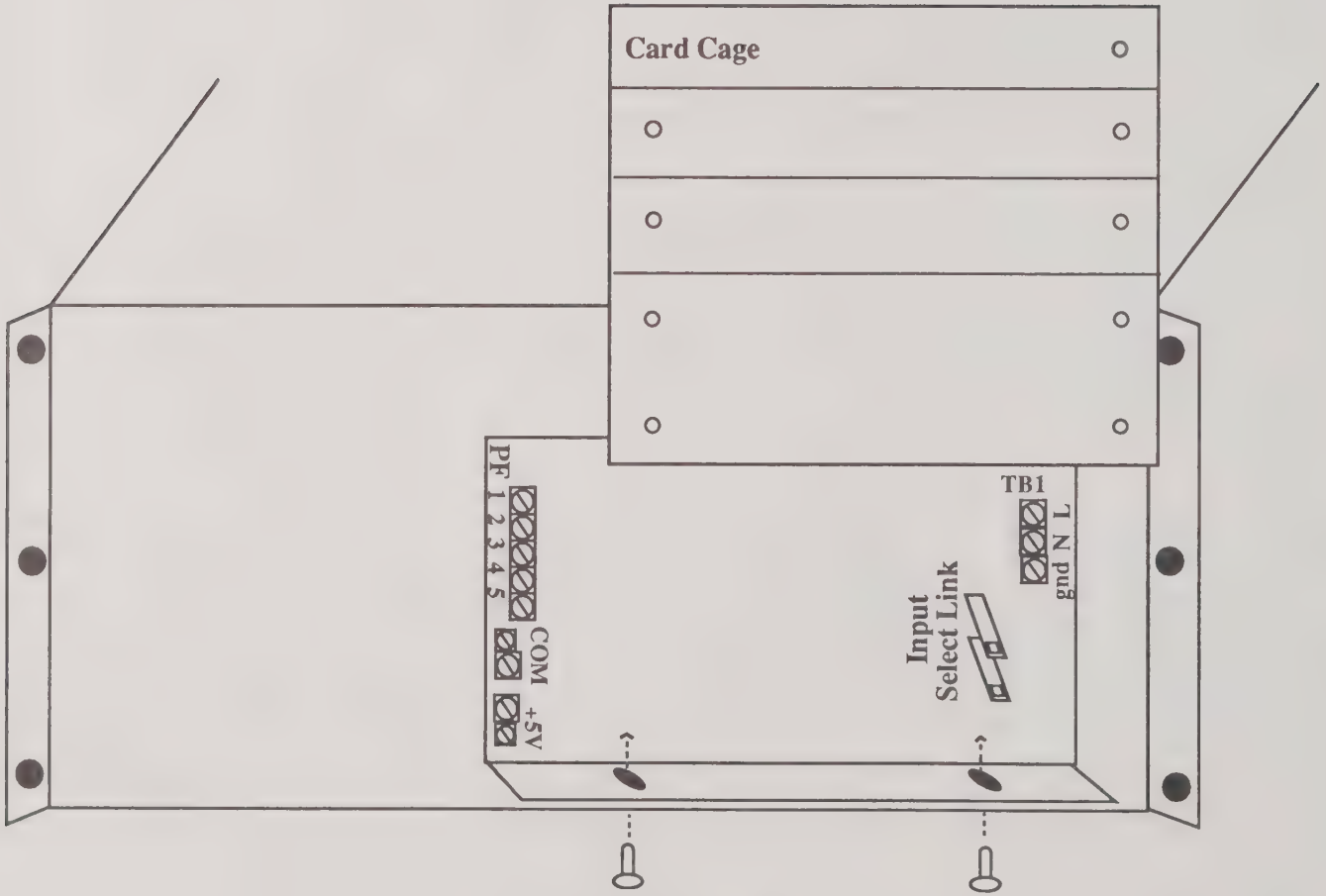
Front View of MT9500 Front Panel

To Access the Potentiometer PC Boards :

1. Turn **Off the power** to the recorder and unplug.
2. Remove the top cover of the recorder.
3. Remove the **Card Cage**. (See Page 43)

To Replace a Potentiometer PC Board:

1. Remove the four **Potentiometer Board Screws** that secure the board to the front panel of the recorder.
2. Remove all twelve **Knob Assemblies** from the Front Panel for the board to be replaced by:
   - **2a**. removing the cap with the white dot from each knob.
   - **2b**. loosening the screw until the knob can be removed from its connecting shaft.
   - **2c**. remove the knob assembly.
3. Remove the **Potentiometer PC Board** and replace.



Back View of MT9500
(Rear Panel removed)

To Remove the 5.12.24V Power Supply :

1. Turn the **Power Off** and **unplug the recorder**. Remove the **Back Cover** of the MT9500 by removing the eight screws that secure the back panel to the side panels and the six screws that attach the rear panel to the card cage.

2. **Note:** The screws that attach the **A/D, I/O and CPU** boards to the card cage may also need to be removed. **DO NOT** remove all four of the screws that attach the **BNC Connector board** (bottom board) to the card cage.

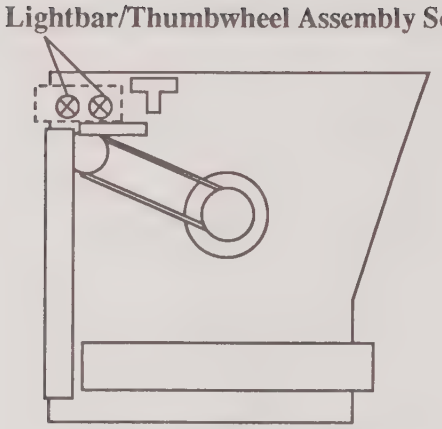
3. Remove the connections (**PF 1-5, +5V, 5VCommon, TB1: N, L, GND, and Input Select Link**) to the power supply. Note that the **Input Select Link** wires should be removed carefully with a pair of pliers.

4. To remove the power supply itself, remove the two screws that secure the supply to the bottom of the case.

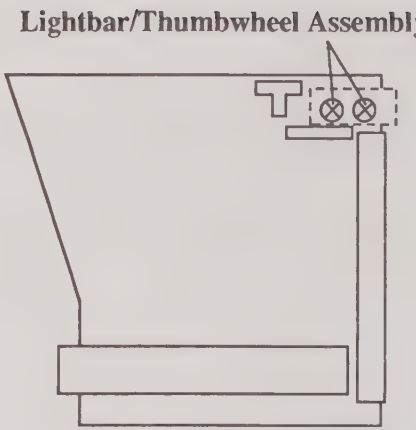
5.12.24V Power Supply Wiring Information

PCB#	Value	Wire Color	Connection
PF1	-12V	Blue	Mother Bd.(31309-000), J5, Pin 1 IRIG Bd.(41627-000)J3, Pin 6 (opt.)
PF2	12VCom.	Black	Mother Bd.(31309-000), J5, Pin 2 IRIG Bd.(41627-000), J3, Pin 5 (opt.) MicroStepper Bd.(41626-000),J4, Pin2
PF3	+12V	Oran.	Mother Bd.(31309-000), J5, Pin 3 IRIG Bd. (41627-000), J3, Pin 4 (opt.) MicroStepper Bd.(41626-000), J4, Pin1
PF4	24V	Gray	MicroStepper Bd.(41626-000), J4, Pin6 Fan Harness, PJ4, Pin 1
		Red	Motor Fan, (23014-000)
PF5	24VCom.	Black	MicroStepper Bd.(41626-000),J4, Pin 5 Fan Harness, PJ4, Pin 1 Motor Fan, (23014-000)

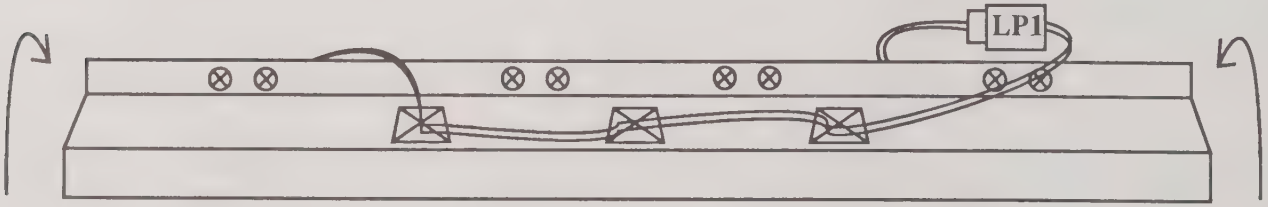
PCB#	Value	Wire Color	Connection
	5VCom.	Black	Mother Bd. (31309-000), J4, Pin 1 Slave Contr. Bd.(41630-002), J6, Pin 1 Master Contr Bd.(41630-001), J6, Pin 1 IRIG Bd. J3, Pin 1 MicroStepper Bd.(41626-000),J4, Pin 4
	+5V	Red	Mother Bd, J4, Pin 2 Slave Contr. Bd, J6, Pin 2 Master Contr. Bd, J6, Pin 2 IRIG Bd. J3, Pin 2 MicroStepper Bd., J4, Pin 3
TB1	L	Blue	24V Power Supply, TB1, L
	N	White	24V Power Supply, TB1, N
VS1		Brown	Input Select Harness, Pin 3
VS2		Bl/Wh	Input Select Harness, Pin 4



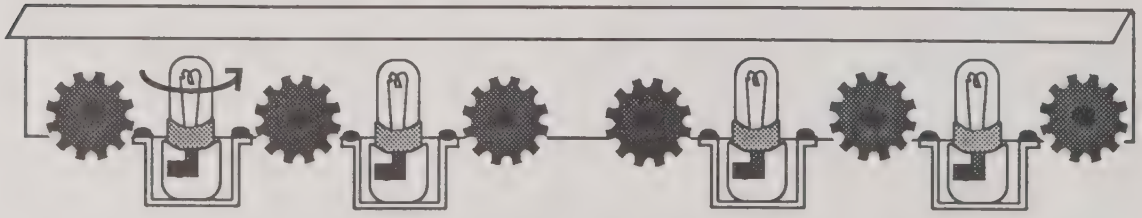
Right Side View of MT 9500



Left Side View of MT9500



Front View of Lightbar/Thumbwheel Assembly



Underside of Lightbar/Thumbwheel Assembly

To remove the Lightbar/Thumbwheel Assembly:

1. Turn the **Power Off** and **unplug the recorder.**

2. Remove the **Front Panel** of the MT9500 (see pages 40, 41 for instructions and illustration).

3. Remove the four **Lightbar/Thumbwheel Assembly Screws.** These screws are located on the upper front corner of each side panel.

4. Disconnect the **LP1** Harness.

5. Gently rotate the front edge of the Assembly up and slightly backwards to disengage the thumbwheel screws from the printhead springs.

6. Slowly lift the **Lightbar/Thumbwheel Assembly** from the MT9500.

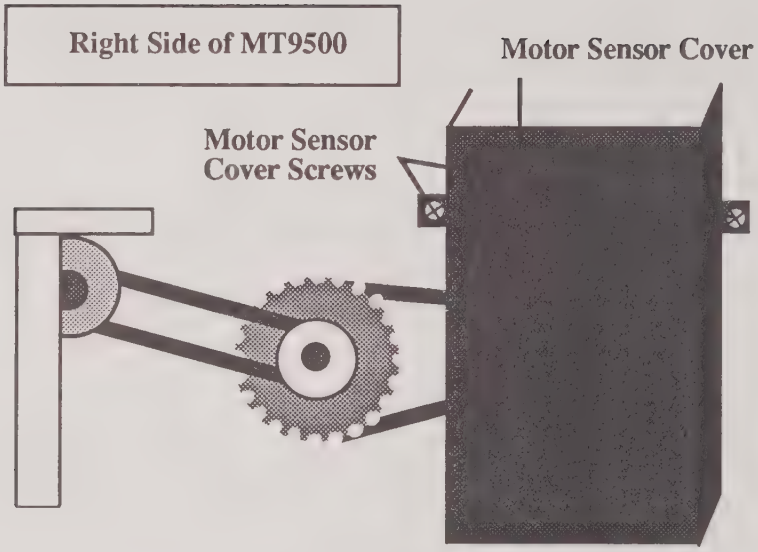
To remove a lightbulb:

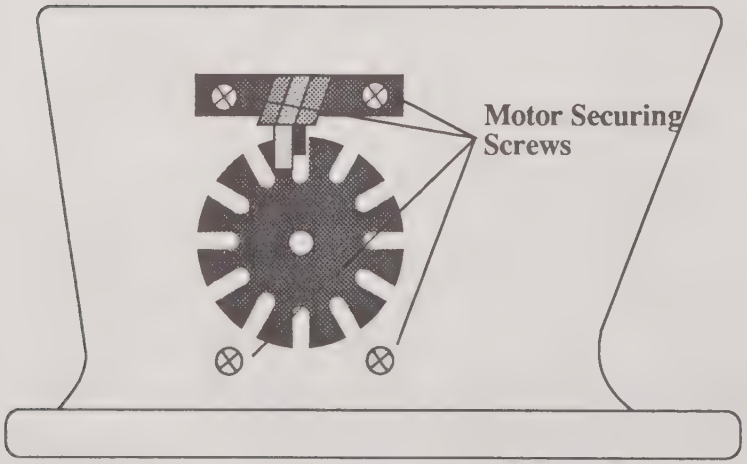
1. Remove the **Lightbar/Thumbwheel Assembly**.

2. Gently press down on the bulb while turning to the right to disengage the bulb.

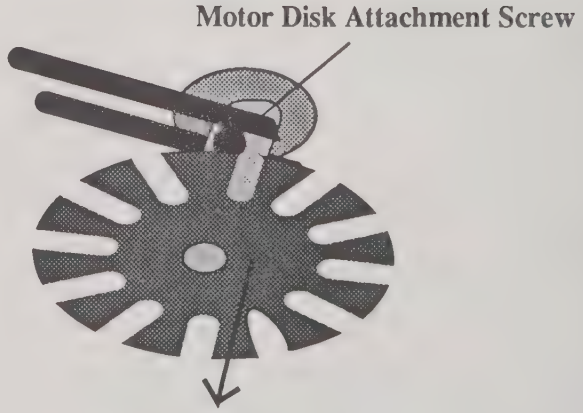
3. Lift off and replace the bulb.

Note: It will be necessary to readjust the Thumbwheels to ensure optimum print quality after this procedure. See page 19 for complete instructions.





Right Side View of MT9500
Detail of Motor Sensor, Cover Removed



Detail of Motor Sensor Disk

The **Stepper Motor** is attached to the interior right side wall of the MT9500 and is connected to the **Motor Sensor Assembly** by the four **Motor Securing Screws.**

To replace the Stepper Motor:

1. First turn the **Power Off** and **unplug the recorder**. Then remove the back cover of the MT9500.
   - **A.** Remove the **Back Cover** of the MT9500 by removing the eight screws that secure the back panel to the side panels and the six screws that attach the rear panel to the card cage.

   - **B. Note:** The screws that attach the **A/D, I/O and CPU** boards to the card cage may also need to be loosened or removed to allow the back cover to be detached. **DO NOT** remove all four of the screws that attach the **BNC Connector Board** (bottom board) to the card cage.

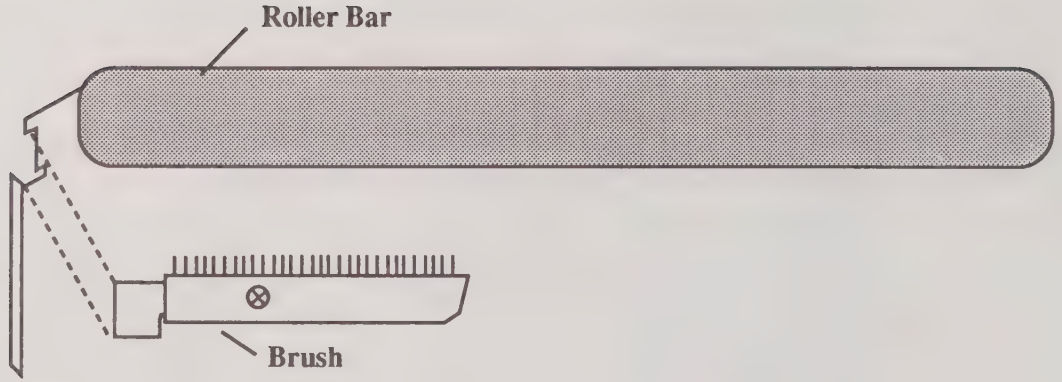
2. Remove harness **J6 (P6)** from the **MicroStepper PC Board** (41626000).

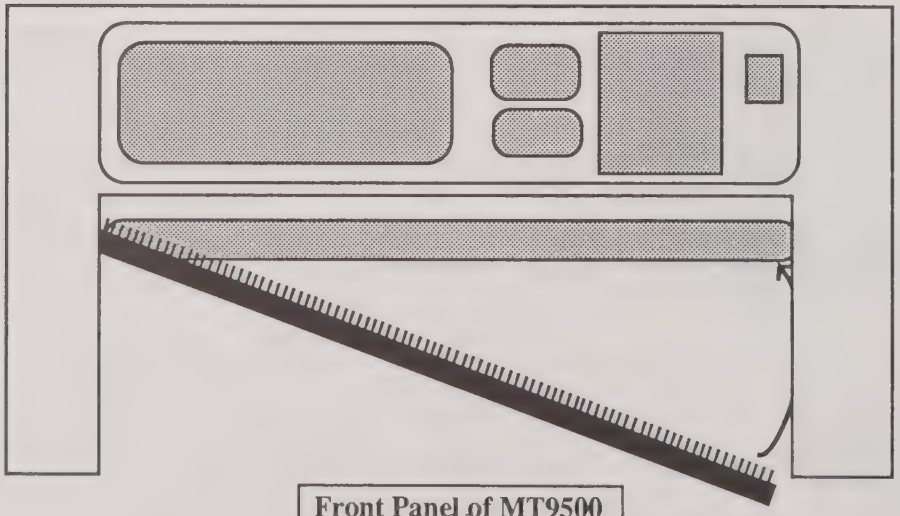
3. Remove all four **Motor Securing Screws** which attach the **Motor Disk** (Outside) and the **Stepper Motor** (Inside) to the Right Side Plate of the MT9500.

4. Remove the **Motor Disk Attachment Screw**. This screw is an Allen type screw and is located on the shaft of the motor between the side of the MT9500 and the Motor Disk.

5. Hold the **Motor** in one hand and the **Motor Sensor Disk** in the other and gently separate the two making sure to avoid hitting the Motor Sensor with the Motor Disk during removal.

6. When reassembling the motor assembly, make sure that the **Motor Sensor Disk** lies between the two vertical arms of the **Motor Sensor**.





Front Panel of MT9500
(Static Brush Installation)

If the **Front Panel** of the MT9500 recorder has been removed to access an assembly, the **Roller Brush** will need to be reinserted before the Front Panel can be fully reattached to the sides.

To reattach the brush:

1. Replace all six screws that attach the front panel to the side panels, but only tighten them half way.

2. Position the brush on the bracket next to the roller as illustrated to the left.

3. It is generally easier to set in the left side (facing the recorder) first then slide the right side between the front and side panels until it is in position.

4. Tighten the six front panel screws down fully.

Front Panel Disassembly Parts List **P. 58**
Front Panel Exploded View P. 59
Keyboard/Display Assembly Schematic P. 60
Potentiometer Board Assembly Schematic P. 61
Front Panel AC Harness Assembly and Power Switch P. 62

Rear Panel Disassembly Parts List **P. 64**
Rear Panel Exploded View P. 65
Voltage Selection Harness Assembly and Switch P. 66
Rear Panel Fans and Harness Assembly P. 67
Rear Panel AC Input Harness Assembly P. 68
Connectors, AC Power and IEC Voltage Selectable P. 69

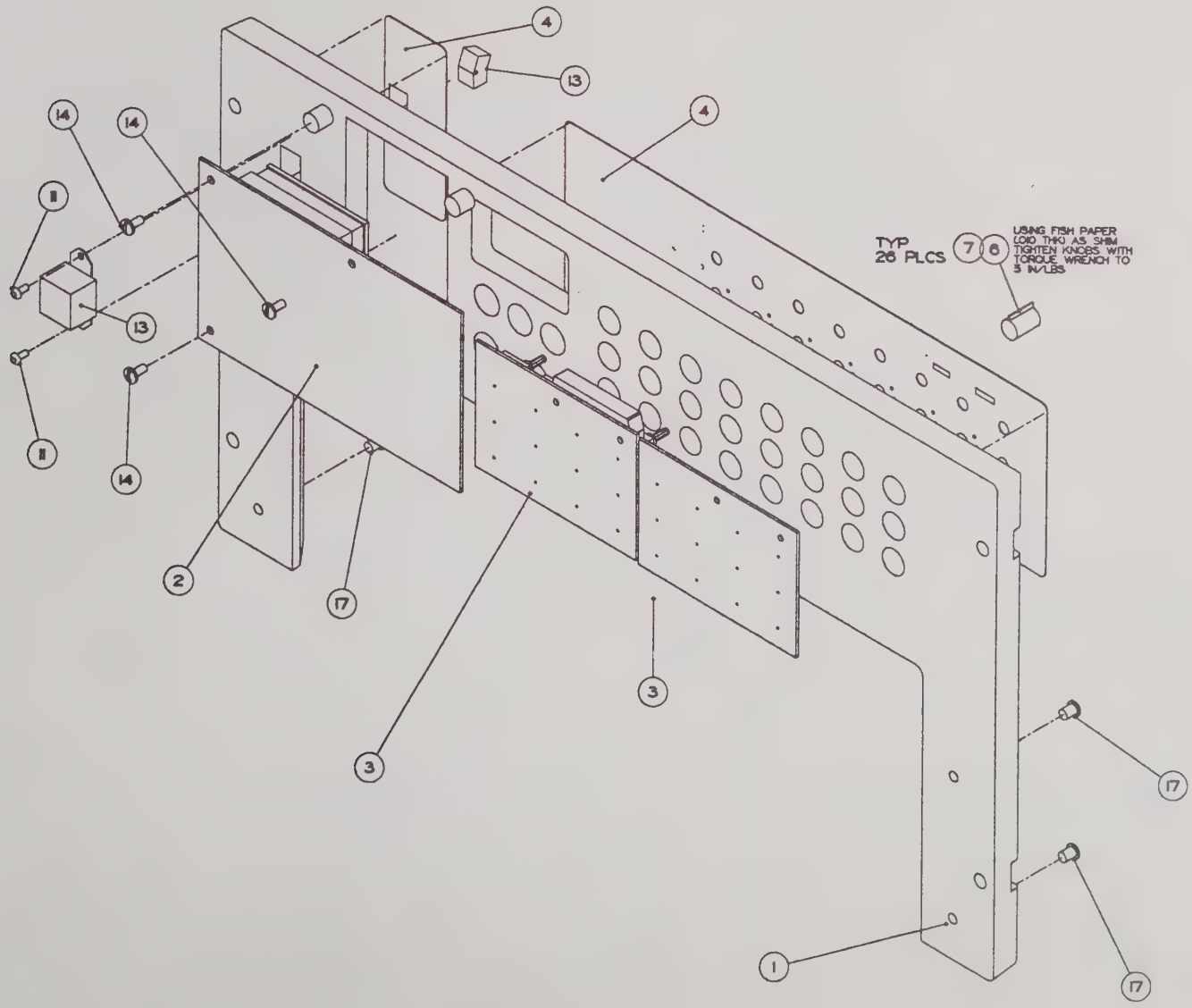
Right Side Panel Disassembly Parts List **P. 70**
Right Side Panel Disassembly P. 71
Motor Assembly and 3.8A Stepper Motor P. 72

Chassis Disassembly Parts List **P. 74**
Chassis Disassembly Exploded Views P.75 thru P. 77

Base Compartment Disassembly Parts List **P. 78**
Base Compartment Exploded View P. 79
160 Watt, Multi-Output and 250Watt
Single Output Power Supplies P. 80
Power Supply Fan and Harness Assembly P. 81

Front Panel Disassembly Schematic Parts List

Schematic #	Part #	Description	Subassembly Parts List		
			Schematic #	Part #	Description
1	41222112	Front Cover			
2	41220001	Keyboard Assembly, MT 95/88.....	17	22484001	Plate Switch
			18	10642012	Washer
			19	11665000	Nut
			20	12654000	Nut
			21	10642027	Washer, Lock
			S1	21729010	BCD Switch
			S2	12451001	Switch
			S3,4	12451002	Switch
3	31324001	Potentiometer Board Assembly, MT95/88.....	2	10972207	Rotary Switches
			3	21241124	Connector, 24 Pin, Right Angle
			4	22478103	10K Potentiometer
			5	21243003	Latch Connector
			6	22483001	Potentiometer Plate
			11	10642012	Washer, Lock #12
4	41223002	Front Panel Overlay			
6	22490002	Knob with Line, 10mm			
7	22490010	Caps, Peaked with Pointer			
9	10610008	Screw, #8, 1/4in, Pan Head Phillips			
11	11548006	Screw, #4, 3/16, Bind Head Slot w/undercut			
13	22523010	Front Panel AC Harness Assembly, MT95/88.....	1	10308002	Pin Strip Connector
			2	10328040	4 Pin Connector
			3	10484006	22 AWG Wire, White
			4	10484007	22 AWG Wire, Black
			7	21438100	Power Switch
14	10610010	Screw, #8, 5/16in, Pan Head Phillips			
17	22744020	Snap Rivet, Nylon			


4
13
4
14
14
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13
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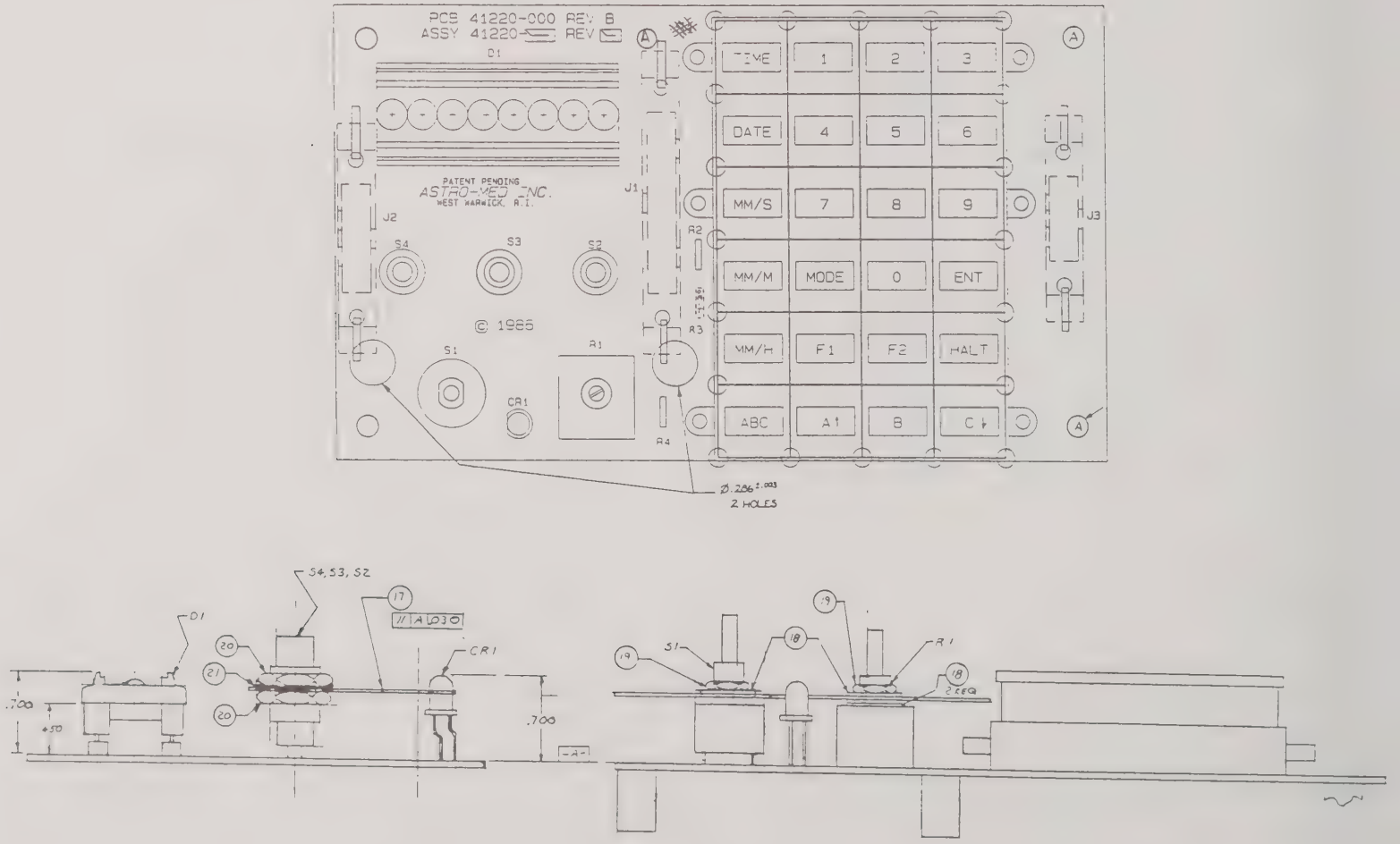
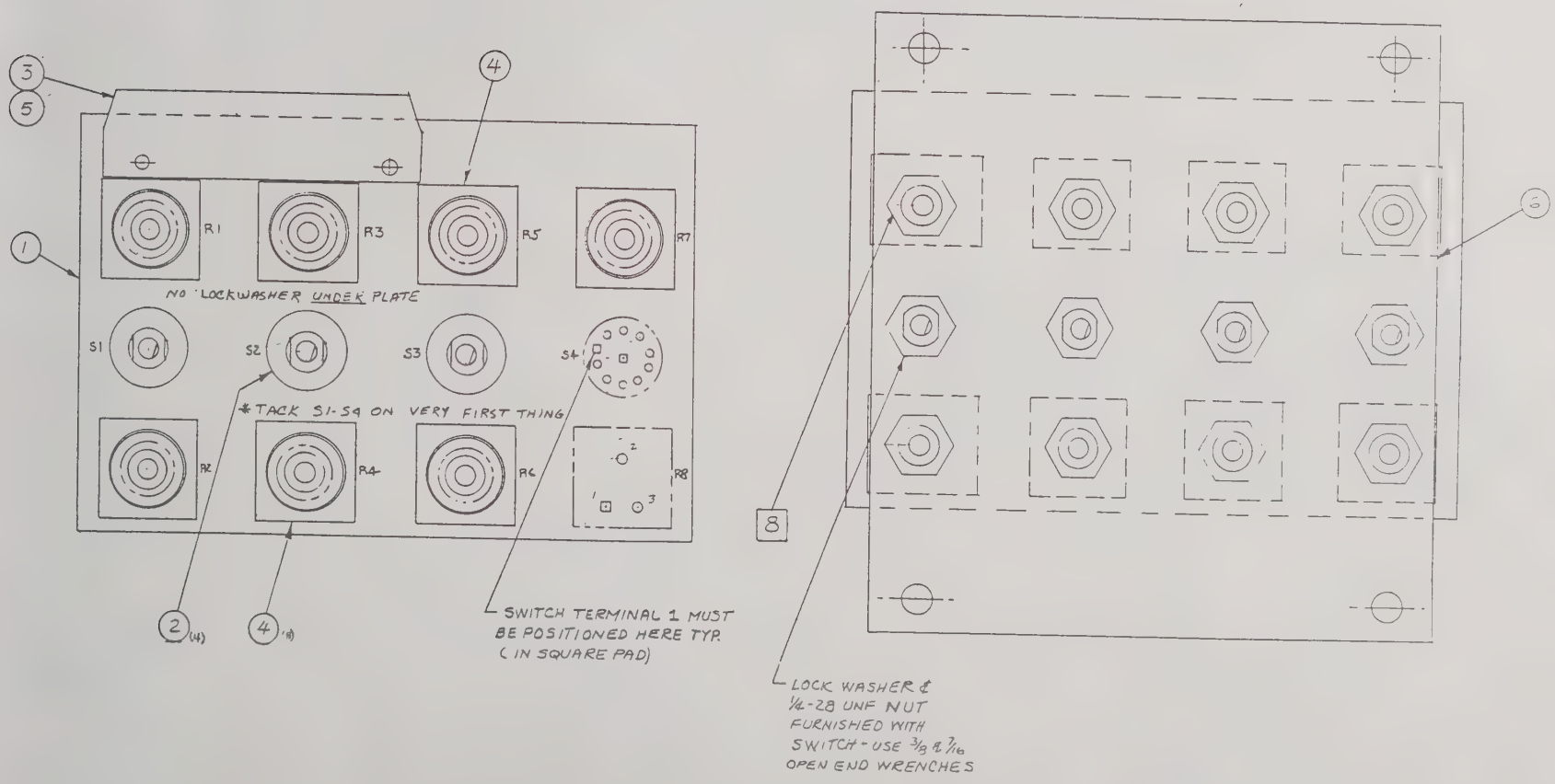
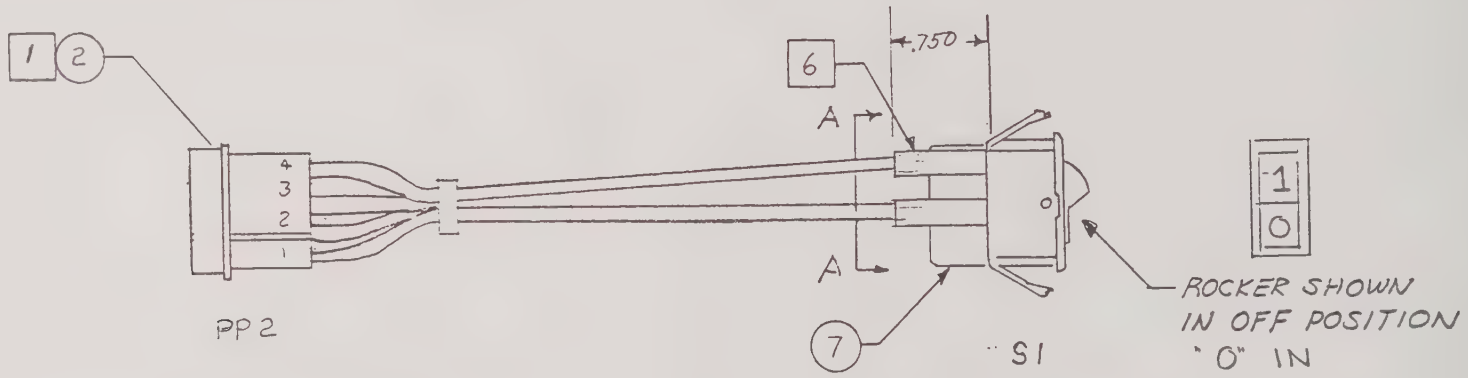
14
2
17
3
3
TYP
26 PLCS
7
6
USING FISH PAPER
.010 THK AS SHIM
TIGHTEN KNOBS WITH
TORQUE WRENCH TO
5 IN/LBS
17
1
17

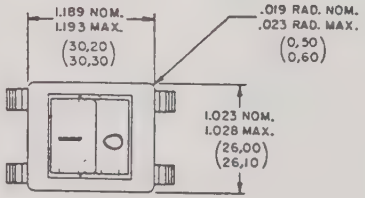

PCB 41220-000 REV B
ASSY 41220- REV
D1
PATENT PENDING
ASTRO-MED INC.
WEST WARWICK, R.I.
© 1985
J1
J2
J3
S1
S2
S3
S4
R1
R2
R3
R4
CR1
TIME
1
2
3
DATE
4
5
6
MM/S
7
8
9
MM/M
MODE
0
ENT
MM/H
F1
F2
HALT
ABC
A↑
B
C↓
2 HOLES
S4, S3, S2
CR1
.700
.450
S1
2 REQ

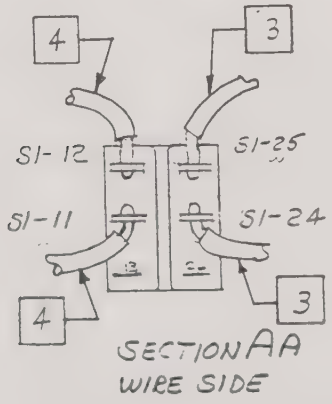

3
5
4
1
R1
R3
R5
R7
NO LOCKWASHER UNDER PLATE
S1
S2
S3
S4
*TACK S1-S4 ON VERY FIRST THING
R2
R4
R6
R8
2 (4)
4 (1)
SWITCH TERMINAL 1 MUST BE POSITIONED HERE TYP. (IN SQUARE PAD)
8
LOCK WASHER & 1/4-28 UNF NUT FURNISHED WITH SWITCH - USE 3/8 & 7/16 OPEN END WRENCHES

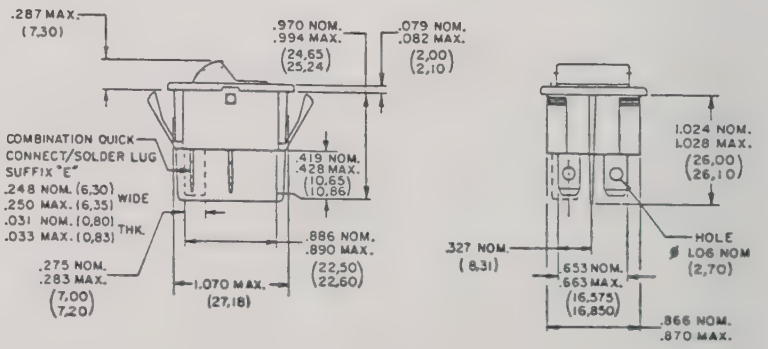


WIRE RUN LIST				
FROM	TO	WIRE	COLOR	LENGTH
PP2 - 4	S1 - 12	AWG 22	BLK	5.00
PP2 - 3	S1 - 11	AWG 22	BLK	5.00
PP2 - 2	S1 - 25	AWG 22	WHT	5.00
PP2 - 1	S1 - 24	AWG 22	WHT	5.00

10308002 PIN USED ON PP2

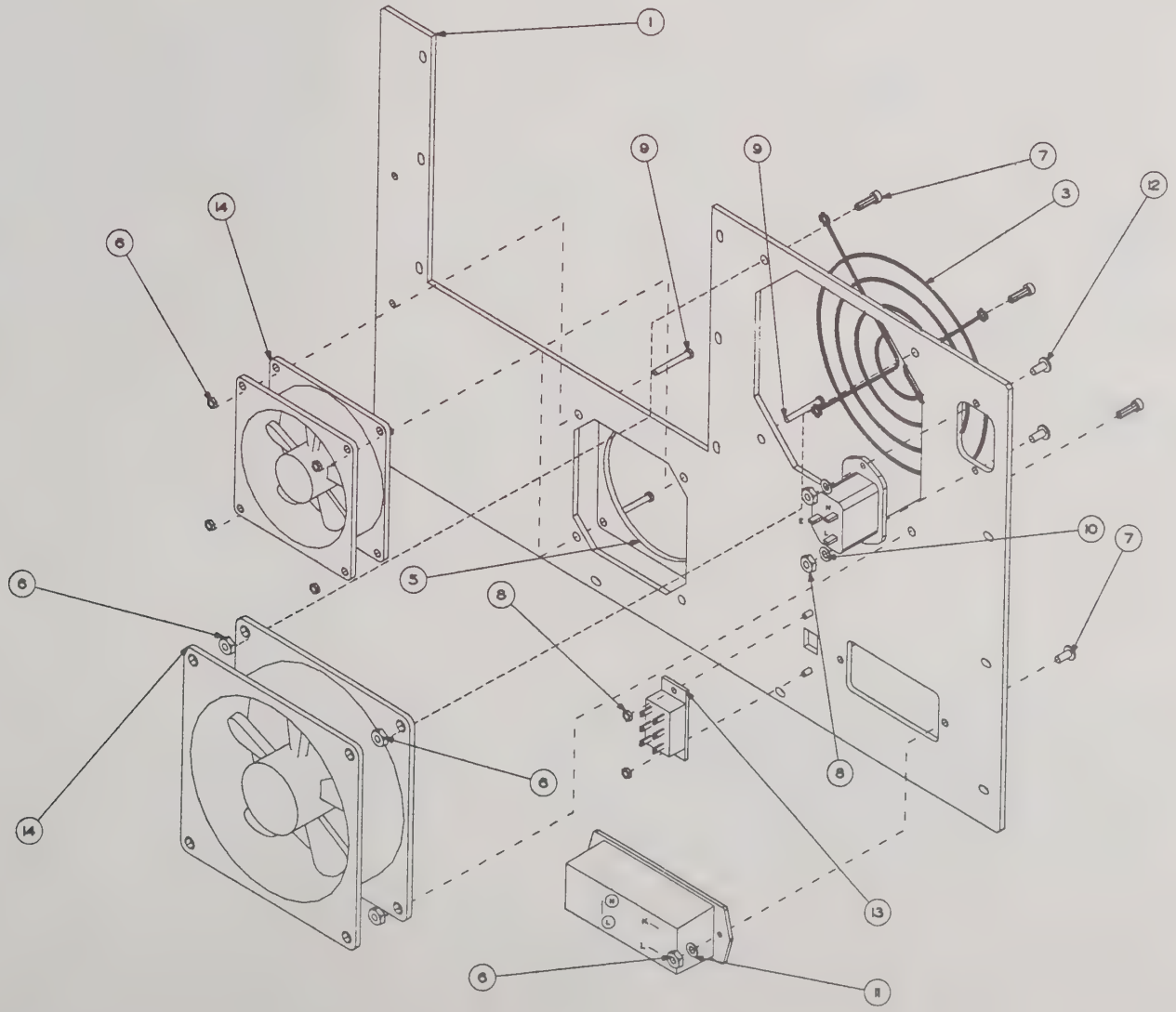






Rear Panel Disassembly Schematic Parts List

Schematic #	Part #	Description	Subassembly Parts List		
			Schematic #	Part #	Description
1	41231201	MT9500 Rear Panel			
3	23015010	81CFM Fan Finger Guard			
5	23014010	30CFM Fan Parts Guard/Media/Retainer			
6	10650006	Nut, #6 Hex, Locking Stop			
7	10609020	Screw, #6, 5/8in. Pan Head Phillips			
8	10650004	Nut, #4, Hex, Locking Stop			
9	10614056	Screw, #6, 1.75 LG, Flat Head Phillips			
10	10643004	Washer, #4, External Tooth, Lock			
11	10643006	Washer, #6, External Tooth, Lock			
12	10608014	Screw, #4, 7/16in, Pan Head Phillips			
13	23016000	Voltage Selector Harness Assembly.....	1	23007000	Voltage Selector Switch
			2	10328040	4 Pin Connector
			3	10308002	Strip Pin Connector
			4	10484001	22AWG wire, Brown
			5	10484010	22AWG wire, White/Black
14	23018000	Rear Panel Fan Harness Assembly.....	1	23015000	81CFM Fan
			2	23014000	30CFM Fan
			3	10328040	4 Pin Connector
			4	10308002	Strip Pin Connector
			5	10330002	Commoning Amp Tab
			6	10482002	24AWG Wire, Black
			7	10482008	24AWG Wire, Orange
			8	11299000	Cable Tie Mount
15	31514000	AC Input Rear Panel Harness Assembly.....	1	22511000	AC Power Recp. Conn.
			2	12632005	IEC Volt Select Conn
			3	10329030	3 SOC Housing Connector
			4	11299000	Cable Tie Mount
			6	10484006	22AWG Wire, White
			7	10484005	22AWG Wire,Green
			8	10484007	22AWG Wire, Black
			9	10363600	Fast Fuse, 6.0 Amp
			10	10365315	Fast Fuse, 3.15 Amp
			13	10327002	SOC Crimp Tab Connector
			14	10506002	Terminal, #6, Lug, Locking
			15	10328040	4 Pin Connector
			16	10308002	Strip Pin Connector
			17	10330002	Tab Commoning Amp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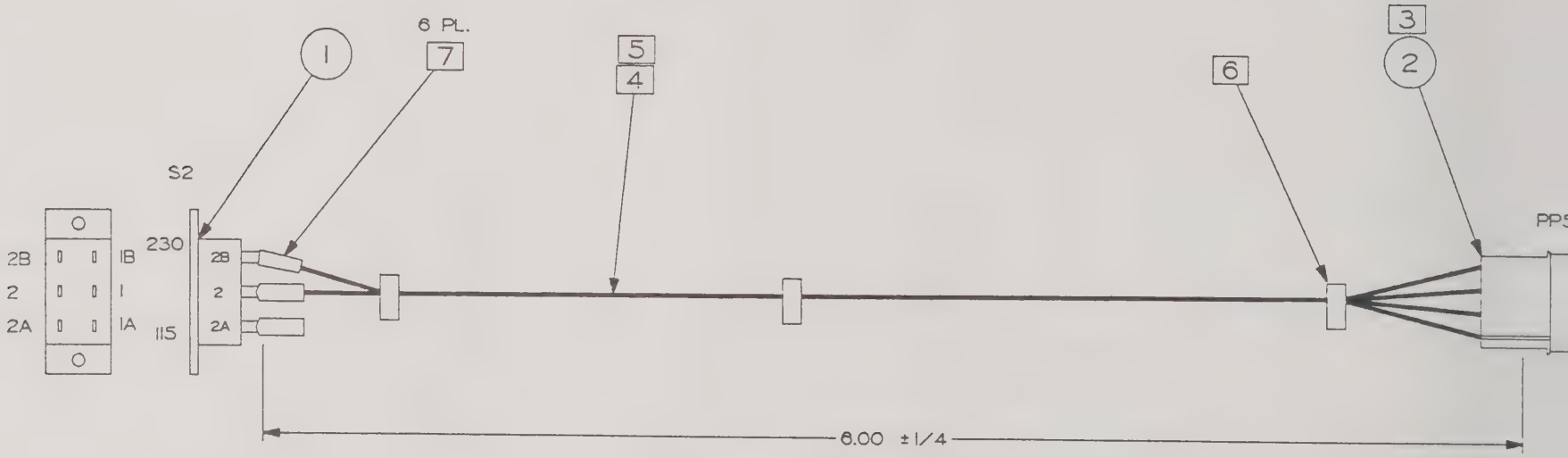
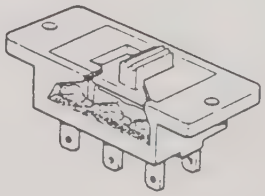
11

Voltage Selection Assembly Harness and Switch



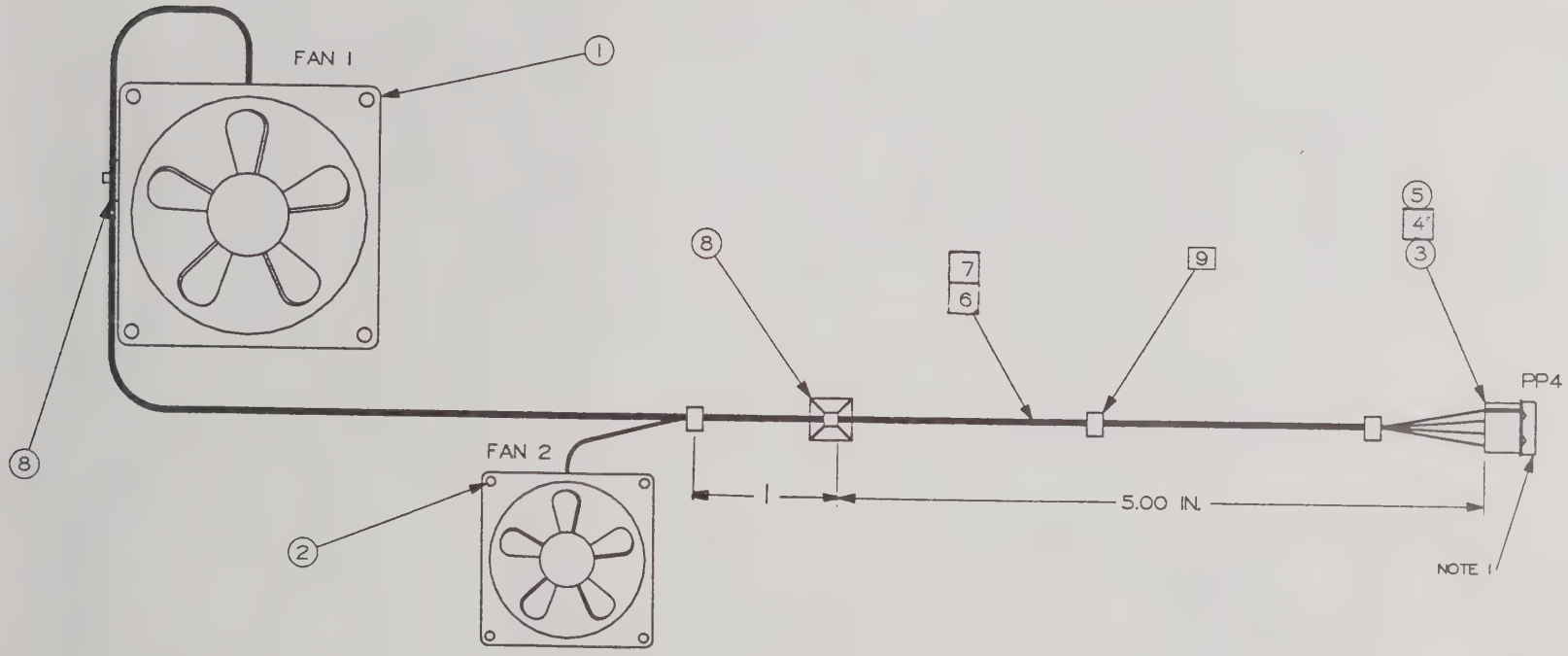
RUN LIST

FROM	TO	TERM	TERM	SIZE	COLOR	LNG
S2-1	PP5-4		10308001	22	WH/BLK	6 IN.
S2-1B	PP5-3		10308001	22	BRN	6 IN.
S2-2	PP5-2		10308001	22	WH/BLK	6 IN.
S2-2B	PP5-1		10308001	22	BRN	6 IN.



SPECIFICATIONS

CONTACT RATING: 10.1 AMPS @ 125 V AC; 5 AMPS @ 250 V AC (UL/CSA).
ELECTRICAL LIFE: 10,000 make-and-break cycles at full load.
MECHANICAL LIFE: 100,000 cycles min.
CONTACT RESISTANCE: Below 10 milli-ohms typ. initial @ 2-4 V DC, 100 mA.
INSULATION RESISTANCE: 10^9 ohms min.
DIELECTRIC STRENGTH: 1,000 V RMS min. @ sea level.



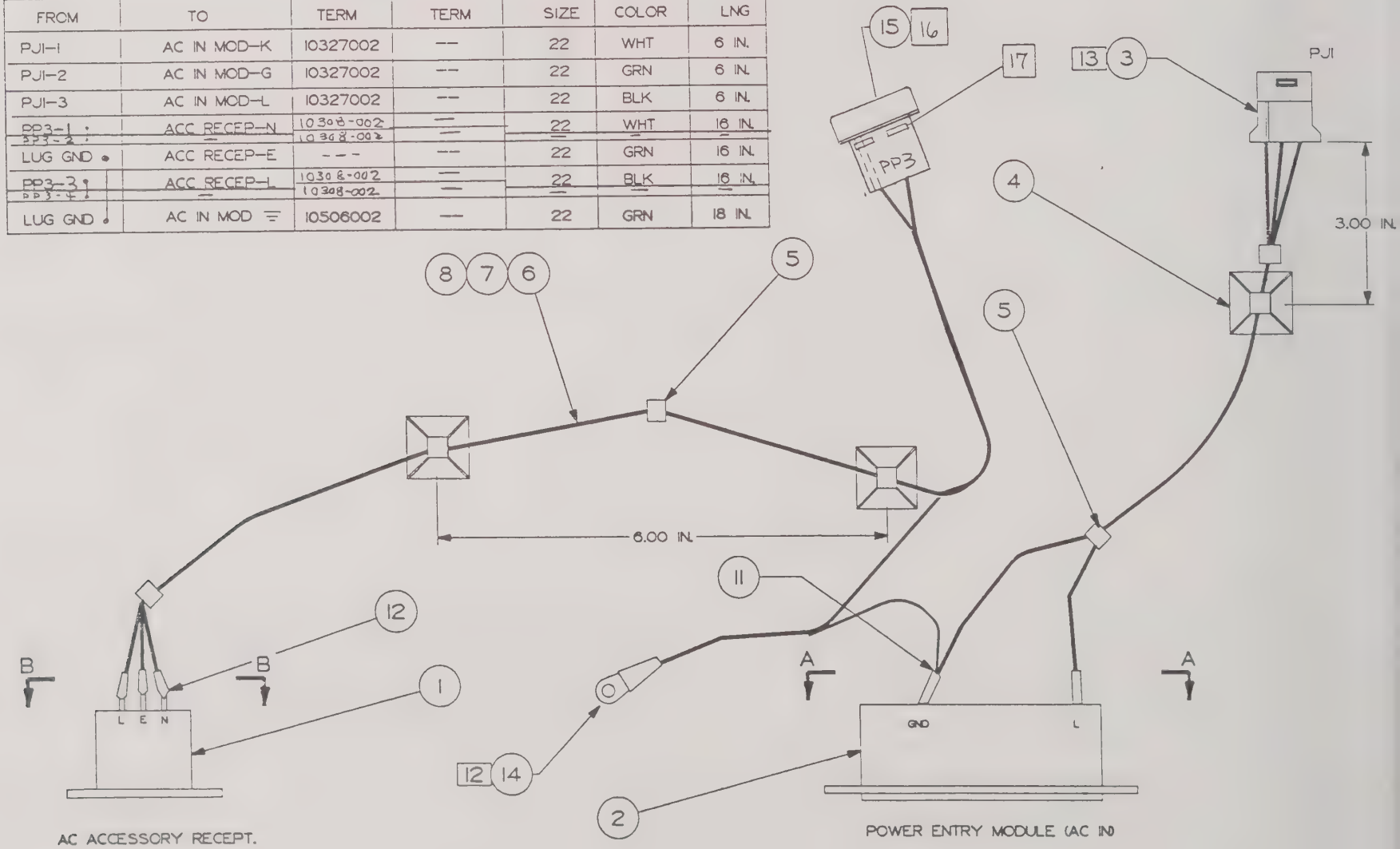
RUN LIST

FROM	TO	TERM	TERM	SIZE	COLOR	LNG
FAN 1	PP4-1	—	10308001	24	ORG	12 IN
FAN 1	PP4-3	—	10308001	24	BLK	12 IN
FAN 2	PP4-2	—	10308001	24	ORG	9 IN
FAN 2	PP4-4	—	10308001	24	BLK	9 IN

NOTE 1 COMMONING TAB BETWEEN PP4-1 & 2, PP4-3 & 4.

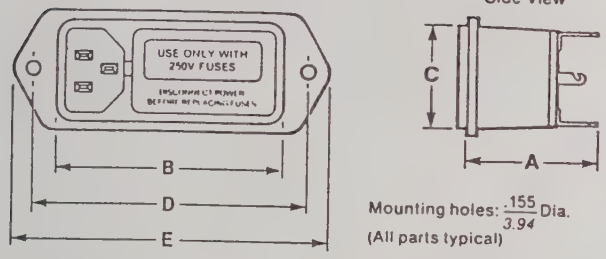
RUN LIST

FROM	TO	TERM	TERM	SIZE	COLOR	LNG
PJI-1	AC IN MOD-K	10327002	--	22	WHT	6 IN.
PJI-2	AC IN MOD-G	10327002	--	22	GRN	6 IN.
PJI-3	AC IN MOD-L	10327002	--	22	BLK	6 IN.
PP3-1 ; PP3-2	ACC RECEP-N	10308-002 ; 10308-002	— —	22	WHT	16 IN.
LUG GND	ACC RECEP-E	---	--	22	GRN	16 IN.
PP3-3 ; PP3-4	ACC RECEP-L	10308-002 ; 10308-002	— —	22	BLK	16 IN.
LUG GND	AC IN MOD ⏚	10506002	—	22	GRN	18 IN.



6VM1

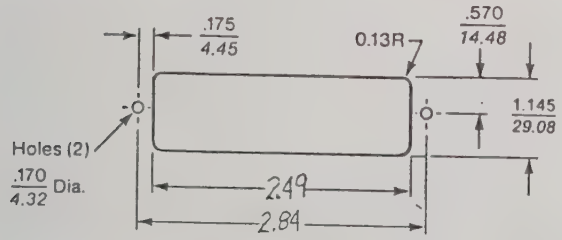
IEC Connector, Selectable Fuse Holder



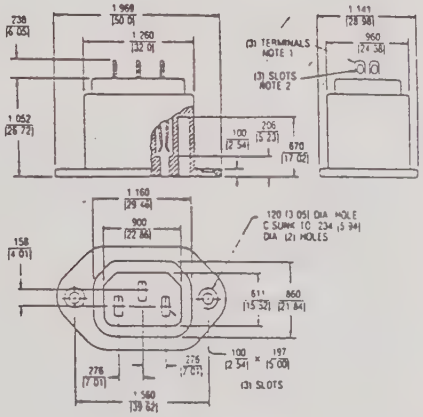
Mounting holes: $\frac{.155}{3.94}$ Dia.
(All parts typical)

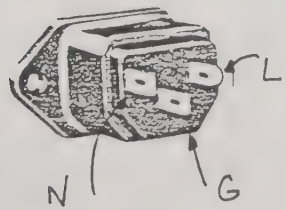
All backplate terminals: $\frac{.110}{2.79}$ fastons, holes: $\frac{.055}{1.40}$ Dia. $\frac{\pm .004}{\pm .100}$
except solder lug ground tab with wire wrap.

Recommended Panel Cutout



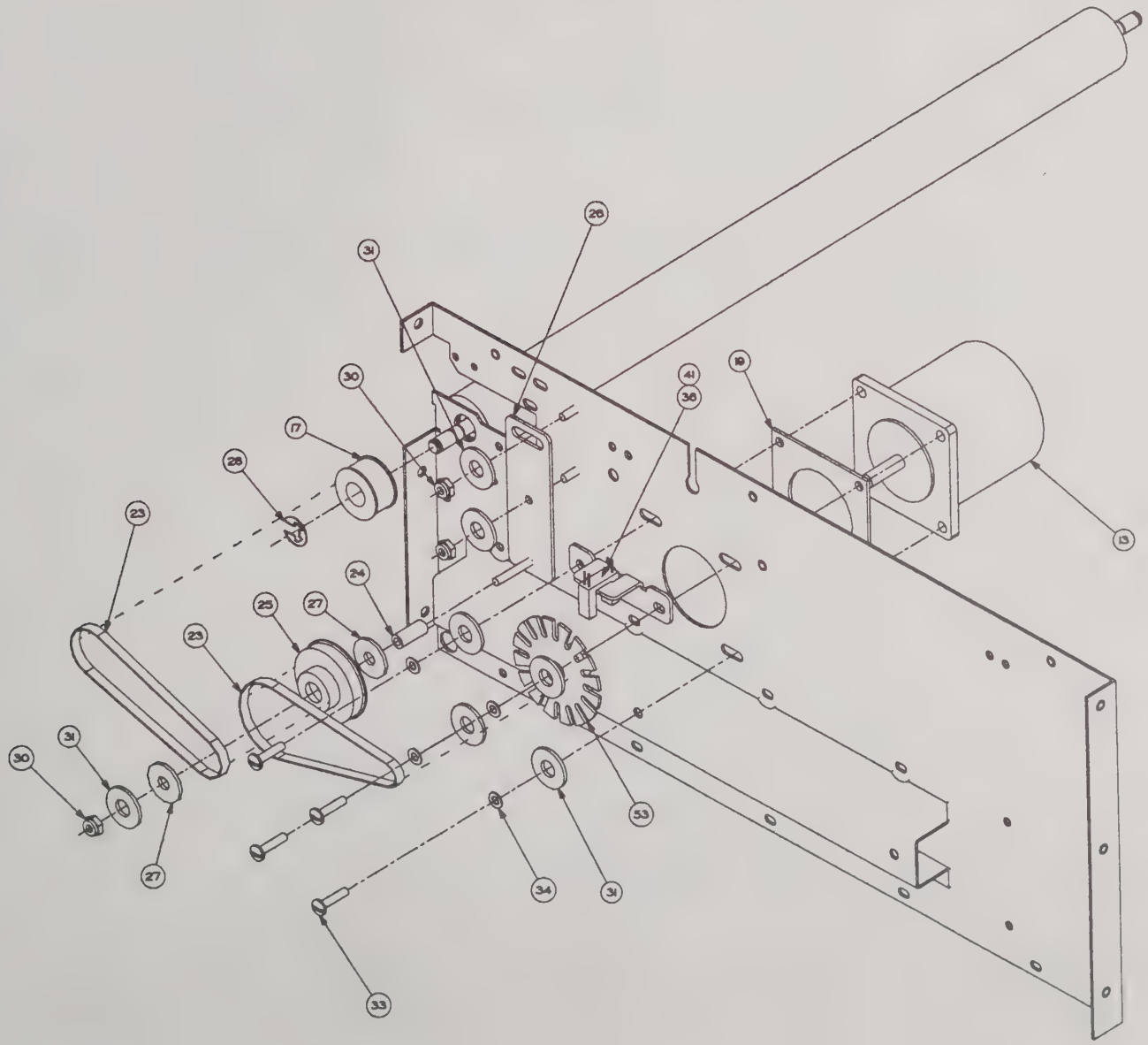
Note: Allows both front and back mounting.





Right Side Panel Disassembly Schematic Parts List

Schematic #	Part #	Description	Subassembly Parts List		
			Schematic	#Part	#Description
13	21881300	Motor Assembly	1	20881310	Stepper Motor, 3.8A
			2	11587306	Connector
			3	11588000	Connector, AWG Strip
			4	10505001	Cable Tie
17	20525036	Pulley Assembly with Clutch, 36T			
19	11660001	Stepper Motor Plate			
23	20391102	Timing Belt, 0.08P, 8.16Lg, 3/16"wide			
24	12405000	Idler Shaft Pulley			
25	12404000	Idler Assembly Pulley			
26	22002002	Bracket with Pem			
27	10649012	Washer, 1/4" flat nylon			
28	10905003	E-Ring, 1/4", retaining			
30	10650006	Nut, #6 Hex Locking Stop			
31	10640006	Washer, #6			
33	10609020	Screw, #6, 5/8" Pan Head Phillips			
34	10641006	Washer, #6 Split Lock			
36	22838002	Motion Sensor Harness Assembly			
41	22870002	Sensor Bracket			
53	22751000	Sensor and Disc Assembly			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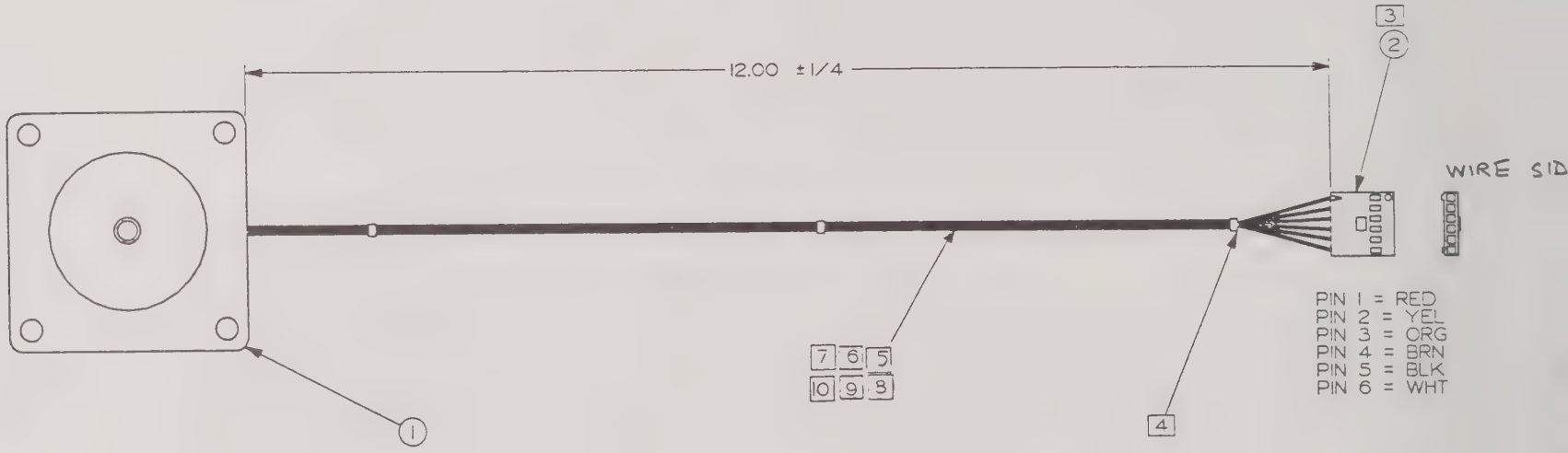
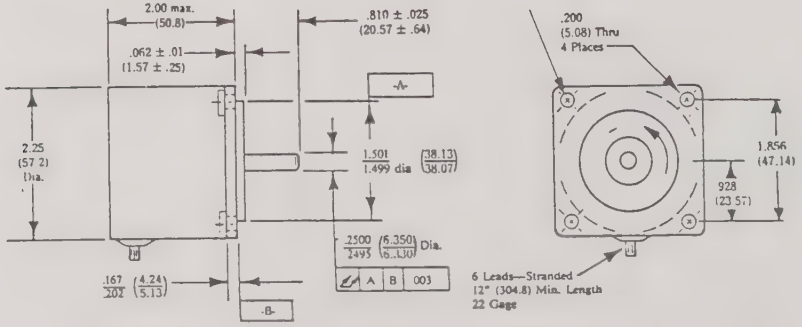
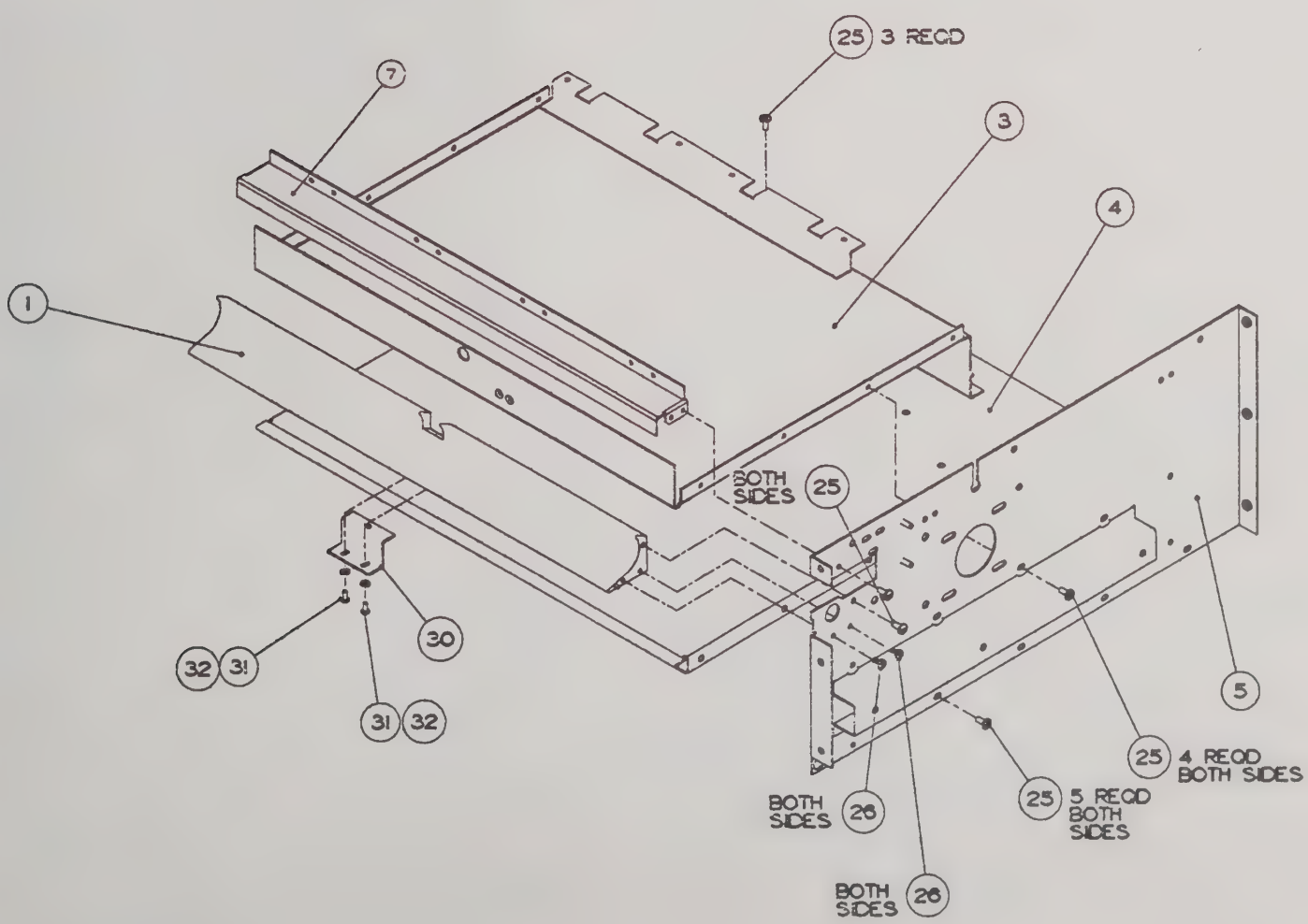


Dimensional Data

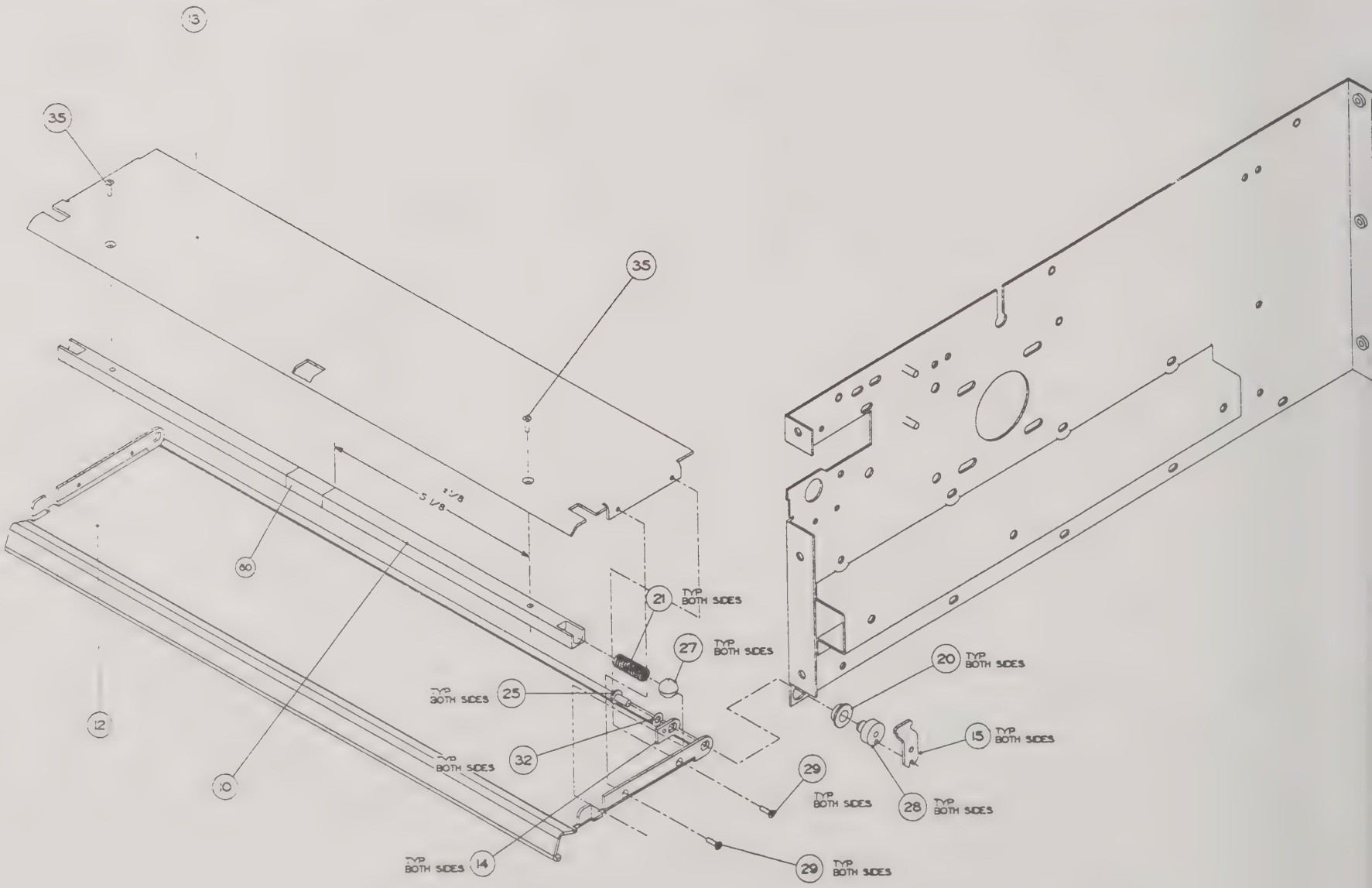


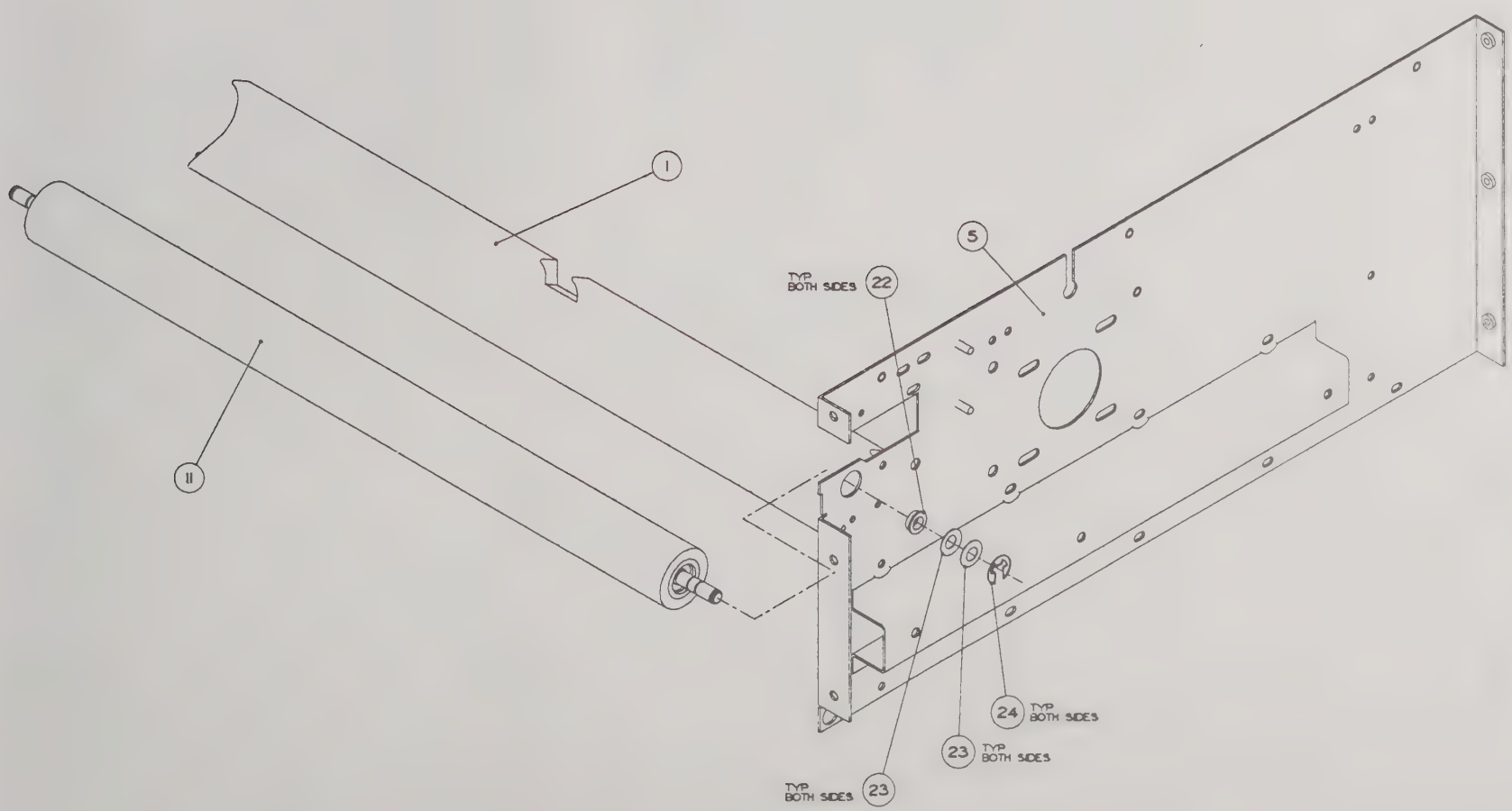
Chassis Disassembly Schematic Parts List

Schematic #	Part #	Description
1	22073003	Paper Chute Strut
3	41126001	Power Supply Bracket with Pems
4	41225012	Paper Tray Bracket with Pems
5	41123002	Right Side Plate with Pems
6	41124002	Left Side Plate with Pems
7	41127011	Adjustable Pressure Spring Bracket with Pems
10	22047011	Spring Bar
11	22435000	Drive Roll Assembly
12	41149011	Door
13	31198911	Door Cover Bracket
14	12754000	Door Shaft Support Plate
15	22788000	Door Stop Bracket
20	10233002	Cilite Bearing
21	10475013	Compression Spring
22	10531008	Flanged Radial Ball Bearing
23	10551005	Washer
24	31428000	Print Head Mount Assembly
25	10609010	Screw, #6 Pan Head Phillips, 5/16"
26	10608012	Screw, #4 Pan Head Phillips, 3/8"
27	12362001	Nylon Ball, 3/16" Diameter
28	12419011	Door Shaft with Stud
29	10964008	Screw, #2 Flat Head, 1/4"
30	22485002	Top of Form Sensor Bracket
31	10640004	Washer, #4
32	10626008	Screw, #4 Soc Head, 1/4"
35	12156006	Screw, #4 Flat Head Phillips, 3/16"
60	10681000	Non-Reflective Target


25 3 REQD
7
3
4
1
BOTH SIDES
25
30
32
31
31
32
5
25 4 REQD BOTH SIDES
BOTH SIDES
26
25 5 REQD BOTH SIDES
BOTH SIDES
26

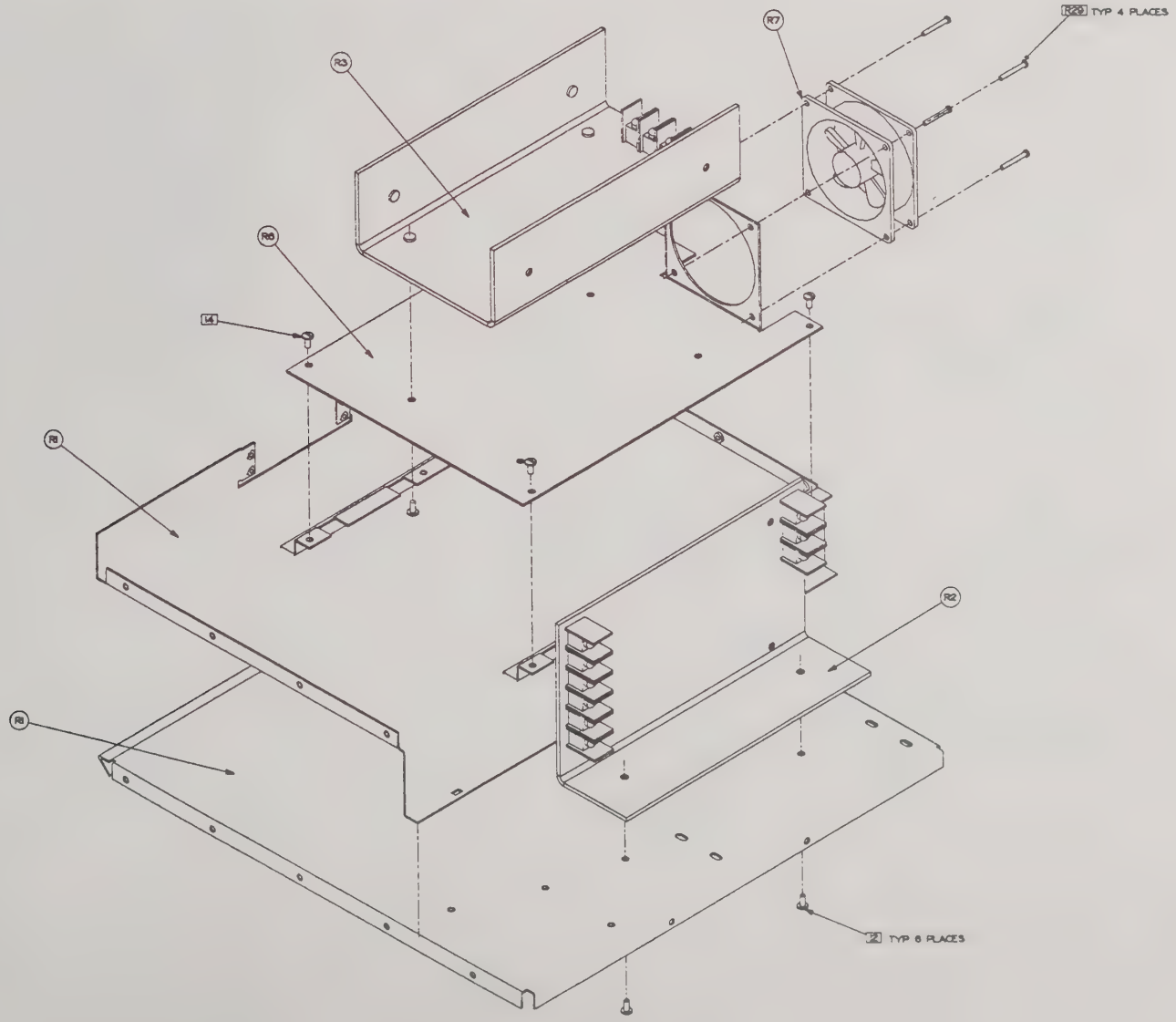
Chassis - Exploded View - Sheet 2

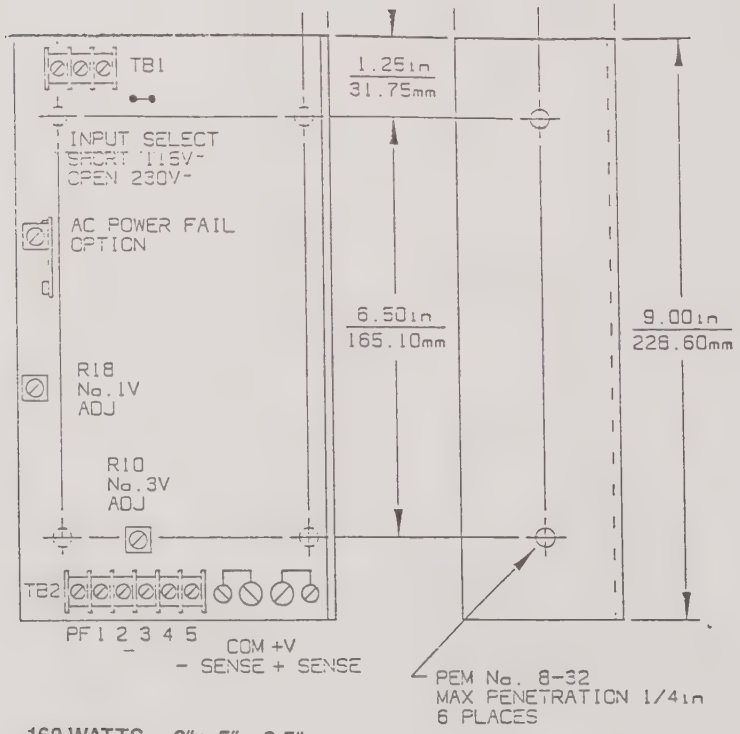



1
11
5
TYP BOTH SIDES 22
24 TYP BOTH SIDES
23 TYP BOTH SIDES
TYP BOTH SIDES 23

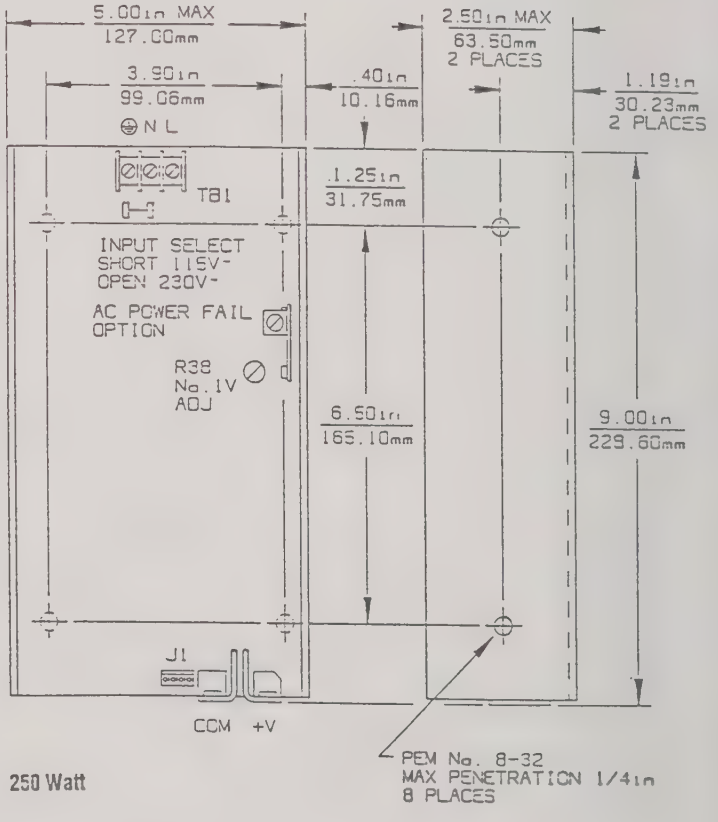
Base Compartment Disassembly Parts List

Schematic #	Part #	Description	Subassembly Parts List		
			Schematic #	Part #	Description
R1	41285000	MT9500 Chassis Assembly			
R2	31374100	5.12.24V Power Supply, 160 Watts			
R3	31374200	24V Power Supply, 250 Watt			
R6	41272001	Power Supply and Fan Bracket			
R7	23017000	Power Supply/Fan Harness Assembly.....	1	23014000	Fan CFM
			2	20230014	Spade Lug, #6
			3	11299000	Cable Tie Mount
			4	10485003	Shrink Tubing
			5	10482002	Wire, 24AWG, Black
			6	10505001	Cable Tie
			7	10482003	Wire, 24AWG, Red
R29	10609042	Screw, #6, Pan Head Phillips, 1 3/8"			
12	10610008	Screw, #8, Pan Head Phillips, 1/4"			
14	10609012	Screw, #6, Pan Head Phillips, 3/8"			

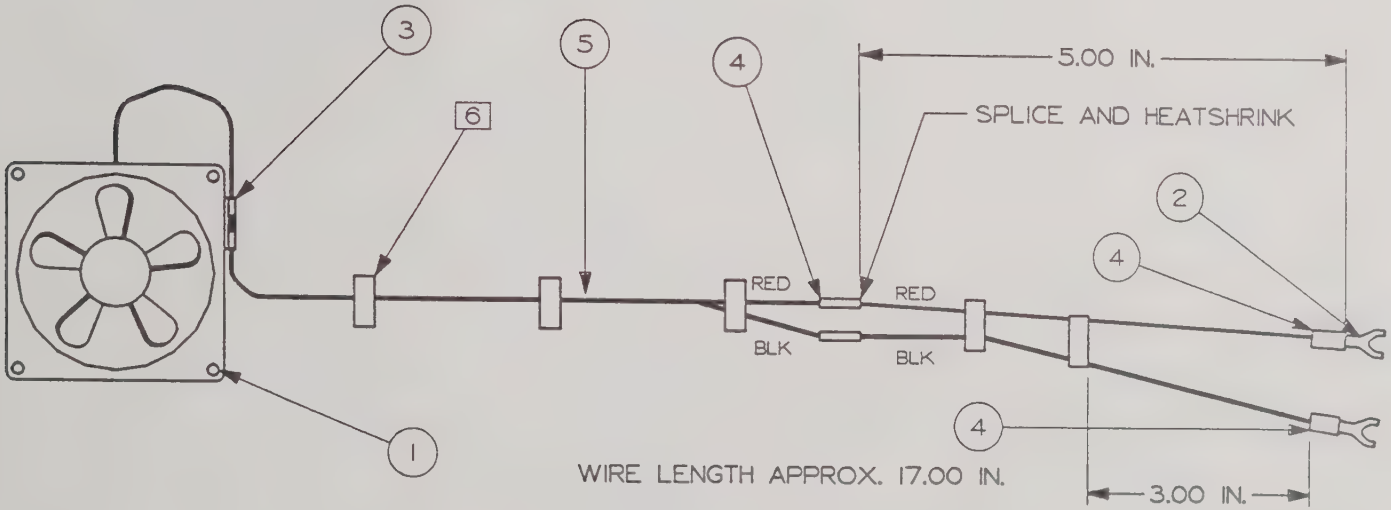

R29 TYP 4 PLACES
R7
R3
R6
L4
R1
R2
R8
2 TYP 6 PLACES

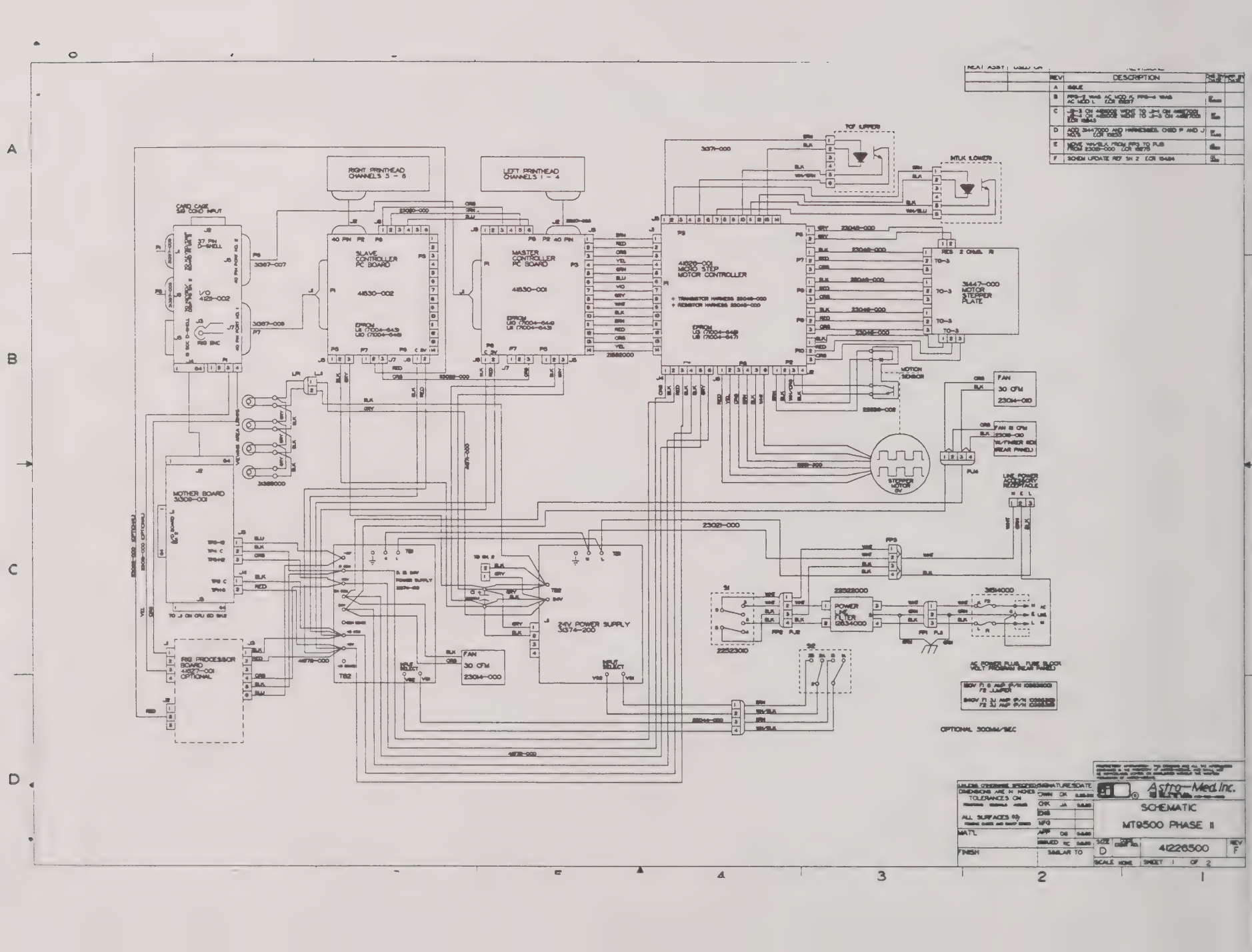


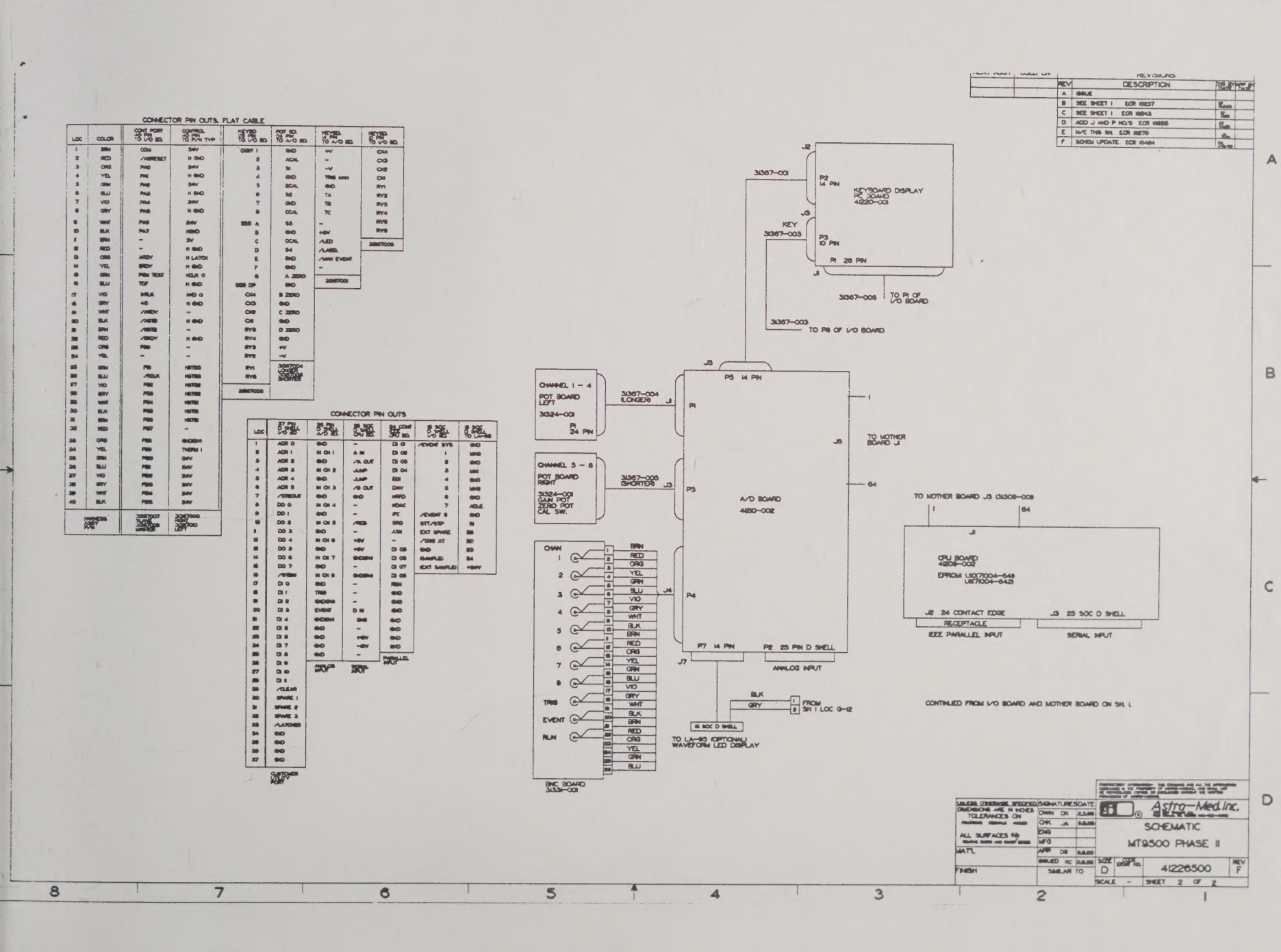
160 WATTS 9" x 5" x 2.5"



250 Watt


3
5
4
6
5.00 IN.
SPLICE AND HEATSHRINK
2
4
RED
RED
BLK
BLK
4
1
WIRE LENGTH APPROX. 17.00 IN.
3.00 IN.


RIGHT PRINTHEAD CHANNELS 5 - 8
LEFT PRINTHEAD CHANNELS 1 - 4
SLAVE CONTROLLER PC BOARD
41830-002
MASTER CONTROLLER PC BOARD
41830-001
41830-001 MICRO STEP MOTOR CONTROLLER
MOTHER BOARD 3308-001
24V POWER SUPPLY 3374-200
FAN 30 CFM 23014-000
FAN 30 CFM 23014-010
STEPPER MOTOR 24V
3447-000 MOTOR STEPPER PLATE
POWER ENTRY MODULE 2833-4000
RIS PROCESSOR BOARD 41827-001 OPTIONAL
TO7 UPPER
MTUK LOWER
MOTOR 3696-001
LINE POWER ASSEMBLY RECEPTACLE
OPTIONAL 3004M/SEC
SCHEMATIC
MT8500 PHASE II
Astro-Med, Inc.
41226500
SIZE D
SCALE NONE
SHEET 1 OF 2
REV F


CONNECTOR PIN OUTS, FLAT CABLE
CONNECTOR PIN OUTS
REVISIONS
REV
DESCRIPTION
A
RELEASE
B
SEE SHEET 1 ECR 19237
C
SEE SHEET 1 ECR 19843
D
ADD J AND P NO.'S ECR 19886
E
M/C THIS SH. ECR 19278
F
SCHEM UPDATE ECR 19484
J2
3367-001
P2
14 PIN
KEYBOARD DISPLAY PC BOARD 4220-001
J3
KEY
3367-003
P3
10 PIN
P1 26 PIN
J1
3367-006
TO P1 OF I/O BOARD
3367-003
TO P8 OF I/O BOARD
J5
P5 14 PIN
CHANNEL 1 - 4
POT BOARD LEFT
3324-001
P1
24 PIN
3367-004
(LONGER)
J8
P1
CHANNEL 5 - 8
POT BOARD RIGHT
3324-001
GAIN POT
ZERO POT
CAL SW.
3367-005
(SHORTER)
J3
P3
A/D BOARD
4230-002
J6
TO MOTHER BOARD J1
1
64
P4
J4
P7 14 PIN
P2 25 PIN D SHELL
J7
ANALOG INPUT
TO MOTHER BOARD J3 (3309-003)
CPU BOARD
4208-002
EPROMS U877004-648
U877004-649
J2 24 CONTACT EDGE
RECEPTACLE
IEEE PARALLEL INPUT
J3 25 SOC D SHELL
SERIAL INPUT
CHAN
TRIG
EVENT
RUN
BRN
RED
ORG
YEL
GRN
BLU
VIO
GRY
WHT
BLK
BNC BOARD
3433-001
TO LA-95 (OPTIONAL) WAVEFORM LED DISPLAY
BLK
GRY
FROM SH 1 LOC G-12
CONTINUED FROM I/O BOARD AND MOTHER BOARD ON SH. 1
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
ALL SURFACES 63
MATL
FINISH
SIGNATURE
DATE
DWN DK
CHK JA
ENG
MFG
APP DS
SIMILAR TO
Astro-Med, Inc.
SCHEMATIC
MT9500 PHASE II
SIZE D
DRAWING NO. 41226500
REV F
SCALE -
SHEET 2 OF 2

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